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ABSTRACT

The Guidance Information System (GIS) is a statewide computer-based career information system developed by the Maine Occupational Information Coordinating Committee (MOICC). A time-series design was utilized to investigate the impact of GIS on selected users in public schools and agencies. Participants completed questionnaires immediately after using GIS and six to eight weeks later. The preliminary field testing phase occurred during Spring 1979 with a second field testing phase during Fall and Winter 1979-80. Four different measurements were made during the project. Results indicated that users understood the purpose of GIS, had no trouble using it, and found the system interesting and motivational. GIS was most effective in providing occupational and career information, and had a greater impact on educational decision-making by public school users than by agency users. Some users found GIS helpful in developing job-seeking and job-keeping skills. GIS stimulated changes in school guidance programs and the role of the counselors. The effectiveness of GIS utilization appeared to depend on how it was integrated into each comprehensive career education program. (Author/NRB)

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MOICC AND GIS: AN IMPACT STUDY

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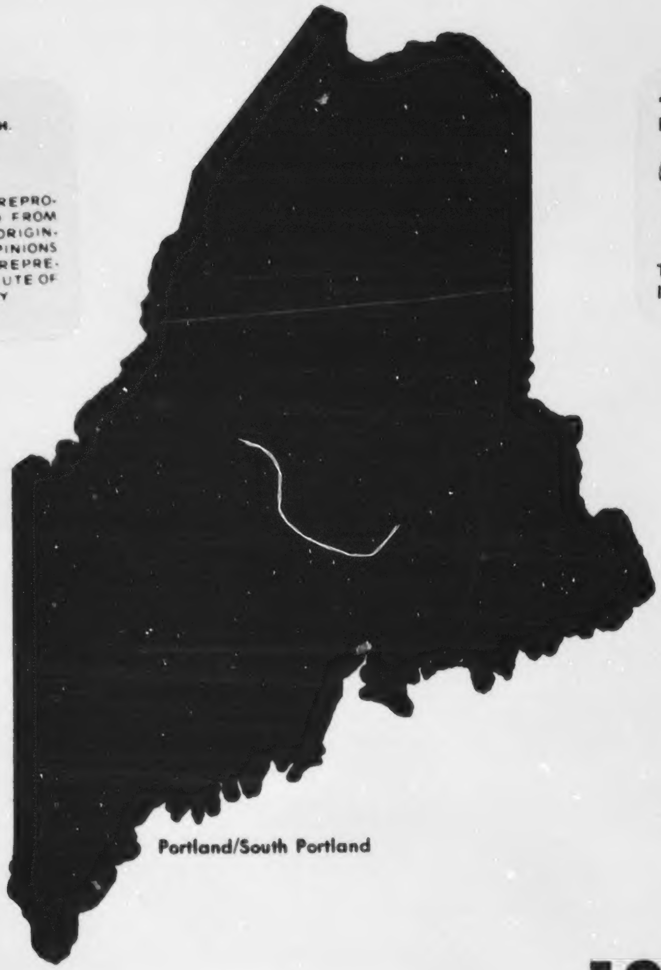

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COLLEGE OF EDUCATION
UNIVERSITY OF MAINE AT ORONO

FINAL EVALUATION REPORT
MOICC: GUIDANCE INFORMATION SYSTEM PROJECT

May 1, 1980

Prepared by

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College of Education
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FOREWORD

This report was prepared to provide impact analysis data on the field implementation of GIS in selected Maine public schools and agencies during 1979. All sites volunteered to participate in the field test after initial contact and explanation by MOICC staff. The results are most gratifying and indicate a serious effort by field site staff to utilize GIS in assisting users with career guidance needs. In the future, sites will need extra implementation time to train staff and design a strategy for reaching more potential users.

In reviewing this report we encourage all readers to communicate with us regarding data interpretation and/or any conclusions drawn by us. It was our intent to provide MOICC staff with an accurate interpretation of the field test results in relation to impact on user career plans, and school and agencies' management functions. To accomplish this, evaluation data were collected to assess user reactions and impact of GIS on management activities. Conclusions in this report are not to be construed as Official Manpower, Education or Human Service policy of the agencies located in Augusta.

C. W. Ryan
R. J. Drummond
May 1, 1980

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EXECUTIVE SUMMARY

IMPACT OF GUIDANCE INFORMATION SYSTEM ON SELECTED AGENCY AND PUBLIC SCHOOL SITES

INTRODUCTION

The purpose of this study was to investigate the impact of the Guidance Information System (GIS) on selected users in public schools and agencies. The sponsoring agency was the Maine Occupational Information Coordinating Committee (MOICC). The committee was charged by executive order of the Governor (August, 1978) to promote and develop a statewide system for career information and has served as a coordinating committee to bring various governmental and educational agencies together in addressing issues related to alternative delivery models for career guidance and career information. After evaluating a number of alternatives and systems, MOICC choose GIS as a vehicle to promote career information to potential users. This report focuses only on the impact of GIS. The evaluation was conducted under a contract between the Maine Occupational Information Coordinating Committee and the Career Education Center, College of Education of the University of Maine at Orono.

The Guidance Information System is a sophisticated career information system consisting of six national files: Occupational, Armed-Services Occupational, Two-Year College, Four-Year College, Financial Aid and Graduate School. Three state files were developed for the project by GIS:

Note: Points of view expressed in this report are not to be viewed as official MOICC policy or position. The authors retain the right to express professional views that may differ from MOICC staff in interpreting the data collected in this study.

Maine Occupational Information, Maine Vocational-Technical Institutes and Maine Financial Aid. GIS is a computer-based information system marketed by Time Share Corporation, a subsidiary of Houghton Mifflin.

MOICC identified the following eight questions to be investigated in the study:

1. Did GIS have an impact on career decision making of public school and agency users?
2. Did GIS have an impact on the educational and training decisions of public school and agency users?
3. Did GIS have an impact on the self awareness of agency and public school users?
4. Did GIS have an impact on the job-seeking skills of public school and agency users?
5. Did GIS have an impact on the job-keeping skills of public school and agency users?
6. How did the users evaluate the system the first time they used it?
7. How did the users evaluate the system after a period of time?
8. What kind of impact did GIS have on the program and personnel at the sites?

A modified time-series design was utilized. The selected participants were asked to fill out a user's questionnaire immediately after using GIS and were given a post-questionnaire to complete six to eight weeks later. There were two phases in the study, a preliminary field-testing phase during the spring of 1979 and a second field-testing phase during the fall and winter of 1979-80. Four different measurements were made during the twelve months of the project.

A sample of users was selected from the following Maine public school sites: Brewer High School; Old Town High School; Hodgdon High School' Southern Aroostook Vocational Education, Houlton; Lewiston High

School; and Edward Little High School, Auburn. The agency sample was taken from Penobscot Consortium, Bangor, Maine; Aroostook Community Action Program, Houlton, Maine; Bureau of Vocational Rehabilitation, Augusta, Maine; Maine Job Service, Bangor, Maine; University of Maine at Augusta and Kennebec CETA; Maine Youth Center, South Portland; and Maine Correctional Center, South Windham.

The site coordinators were asked to follow a quota sampling procedure using random selection. Pre and post questionnaires were developed for both the agency and public school users and revised for the second field testing.

RESULTS

1. What impact did GIS have on career decision making of public school and agency users?

   Around 80 percent of both groups felt that the computer system was a good way to get information about occupations and that they learned a lot about occupations. About half of both groups indicated that GIS helped them to make a career decision. The system also stimulated them to do more reading or talking about careers.

2. What impact did GIS have on educational and training decisions of public school and agency users?

   The system had less impact on educational decision making. About half of the public school sample and one-third of the agency users felt it helped them make educational plans. Twice the proportion of public school users than agency users (51 percent to 26 percent) indicated GIS helped in selecting a specific school or training program.

3. What impact did GIS have on the self-awareness of public school and agency users?

A majority of respondents in both groups did not view GIS as a generalized tool to help them develop self-awareness. About 40 percent of both groups indicated GIS provided some help in understanding their interests, values and abilities. Understanding these personal characteristics is useful in the career search process. A smaller proportion of agency users than public school users felt GIS had an impact on self-awareness.

4. What impact did GIS have on job-seeking skills of public school and agency users?

More agency than public school users perceived GIS as helping them in job-seeking skills (46 percent to 31 percent).

5. What impact did GIS have on job-keeping skills?

A very small proportion of agency users (22 percent) and public school users (nine percent) indicated that GIS had any impact on job-keeping skills.

6. How did users evaluate the system the first time they used it?

Few of the users had problems using the system, the guide sheets or the terminal. The system was fun to use, interesting and motivational to users. Most likely the HAWTHORNE EFFECT was operating in the sites (i.e., they may have given the system higher ratings because it was new and different).

7. How did the users evaluate the system after a period of time?

The delayed response to GIS was in general quite positive. Public school users were less enthusiastic than agency users. Over three-quarters of both groups felt that all should have the opportunity to use the system. Some users did report that they were confused after using GIS.

8. What kind of impact did GIS have on the program and personnel at the sites?

The GIS program had some impact on the counseling program. For example, several sites developed career education courses. Guidance counselors aided teachers in integrating GIS into their courses. Also, small group and peer counseling was utilized. Training to use GIS was made available to other counselors and interested teachers, but usually one person at each site was responsible for the coordination and utilization of GIS.

In depth restructuring of guidance programs did not occur in the short time alloted for field testing GIS. The role of the counselors changed very little. They did not have to spend as much time in information giving; they had more time for individual and group counseling. In general, agency counselors had a more difficult time integrating GIS into ongoing activities.

GENERAL CONCLUSIONS:

After reviewing the evaluation data the following conclusions were drawn:

- Users understood the purpose of GIS and had no trouble in using the GIS guide and summary sheet.
- The system was interesting and motivational to users.
- GIS is most effective in providing occupation and career information.
- GIS has an impact on educational decision making, more so for public school than agency users.
- GIS is not designed to develop job-seeking skills or job-keeping skills, but is perceived by some as aiding them--which may be in part a function of the Hawthorne Effect and/or user response set.
- GIS is not designed to develop self-understanding and awareness but utilizes dimensions of the self in guiding the search process.

- GIS stimulated a degree of change in guidance programs and the role of the counselor.
- GIS is not a substitute for a well-designed career education program. The effectiveness of its utilization depends upon how it is integrated into an ongoing, sequential, comprehensive program. It is a valuable tool.

RECOMMENDATIONS:

The following recommendations were made:

1. There is need for sites to have a system to help individuals who become confused by working with GIS. Small group sessions and/or individual counseling may be necessary. Peer groups trained to help students with using the GIS guide and summary sheets may be one way to reduce anxiety about using the system.
2. The files, especially MEOC (Maine Occupational File), need to be updated frequently and others need to be evaluated periodically.
3. Site coordinators and students from participating sites ought to be utilized in any training sessions held for new sites.
4. The impact that GIS has depends to a large degree, upon the career guidance program at each site. The inclusion of test data from interest, aptitude and achievement testing might help students set more realistic goals and sharpen their search requests. Periodic seminars and in-service sessions on career guidance should be developed; there is a great need for them, as well as seminars on the operation of GIS.
5. The study looked at short-term impact. There is a need for a more in-depth study of users over a longer time span.
6. GIS will not receive full utilization unless an intensive network of workshops is delivered to increase computer literacy and awareness among professionals in human service agencies.
7. Human service agencies and public schools must address the philosophical issues related to integrating computer information systems in daily activities if they are to reduce resistance to such integration.
8. The sites need to have developed a planned program of career education in which GIS is systematically utilized, not just included as a "frill" or an incidental exercise.
9. GIS has potential to be used by subject-area teachers to illustrate the different types of career fields that relate to specialization in that subject area. The system could be used in economics and other social studies areas to study local job markets and job opportunities.

10. Parent and citizen involvement in local workshops illustrating the value of the GIS system might aid in securing local funding for the project.

11. Instrumentation for assessing GIS impacts on users must be carefully selected to assure that what is being assessed correlates with what counselors actually do.

12. Technical assistance to existing and new sites must be improved to assist inexperienced counselors in implementing GIS.

In summary, we faced a number of difficulties in conducting this study at the selected sites. The evaluation design we used had specific limitations, particularly in controlling sample selection and erosion. The instrumentations may not have accurately assessed the career counseling processes that accompanied GIS and must be viewed as a limiting factor. The results imply that counselors were not active implementors of career guidance activities, if we were seeking clearly defined adoption strategies for comprehensive career education. Given the overall constraints of assessing multiple impacts upon varying sites and populations, the results are positive. Users reacted positively to GIS and felt that it was helpful in their career planning.

Future research efforts must pay particular attention to instrumentation selection, sample size, length of study period and outcome processes for specific treatments. We recommend that additional studies be designed to assess the impact of GIS over a three-year period on career planning, decision making, self awareness, job-seeking and job-keeping skills.

Charles W. Ryan
Robert J. Drummond

SECTION 1

INTRODUCTION

This report presents the results of the evaluation conducted by the Center for Career Education under a contract from the Maine Occupational Information Coordinating Committee. MOICC is charged by executive order of the Governor (August, 1978) to promote and develop a statewide system for career information. In addressing this mission MOICC serves as a coordinating committee to bring various government and education agencies together in addressing issues related to career guidance, career information and alternative delivery models. The evaluation results reported here focus only on the impact of the Guidance Information System (GIS) on selected users in public schools and agencies.

The selection of GIS as a prototype to demonstrate in selected schools and agencies was the result of careful analysis of existing computer information systems. Computers have been used in disseminating career information for at least a decade. In this period a variety of critical questions have been troublesome to both developers and potential users of these systems. For example:

1. Which guidance tasks can be performed by a computer, and which of these tasks should be reserved for counselor attention?

Note: The first time a word which is defined in the glossary is used in the text, it will appear in CAPITALS.

2. Is it ethical for a machine to assist a student with career decision making?
3. Should a computer-based guidance system be modeled after what counselors do when performing the same functions, or does the computer have unique capabilities which could be applied to perform the same tasks in a different way?
4. How can computer-based systems be maximally integrated into a total guidance program?
5. What hardware and software capabilities can schools currently afford? Can they afford cathode ray tubes as opposed to typewriter terminals--or even cathode ray tubes with complementary visuals? Can schools afford natural language capability as opposed to selection of multiple-choice items?
6. Will schools and agencies pay for computer-assisted instruction in career guidance content areas, or only for information-retrieval and search-strategy functions?
7. Should career guidance systems be developed as "stand-alone" systems which require a computer dedicated for this purpose alone, or should they be developed for placement in a computer which is also performing a host of other administrative and/or instructional tasks?
8. Should user records be stored in the computer so that personal information can be used in conjunction with the information and experiences provided by the system?

9. Is it possible to create a data-collection method which will provide sufficient, recent, and accurate data and which can be used by all developers alike?
10. How can the immense technical problems involved in such systems be surmounted, and how can "counselor type" people learn to communicate with data-processing specialists?

These are just a few of the questions which have been faced for the first time in the past ten years. In any pioneer effort where such baseline questions are still fresh and unanswered, and especially where funds have been precarious and inadequate, it is to be expected that neither the research questions nor answers are clear and definitive. Every developer of these early guidance systems has attempted to measure the effectiveness of his or her work. After the developer finally wins or survives the battle of grappling with what the system should do and how it should do it, which of a mass of possible hardware and software configurations to get locked into, where to get the money to finance the development, where to get employees who can be trained for a new field, and how to get the system technically operational on schedule, he/she must then address hard research questions. Several of the most difficult questions are, "What shall we measure?" and "What yardsticks shall we use for measurement?" The "whats" to measure might be cognitive occupational knowledge, short-term occupational choice, long-term occupational satisfaction, decision-making skills, self-knowledge, or vocational maturity, as a possible beginning list. The "what to measure with" problem leads the researcher to look at all existing instruments which measure occupational knowledge, self-knowledge, degree of specification of career plans, decision-making skills, and vocational knowledge. The researcher finds that all of the measures are new and experimental and that they do not relate directly to the content of the system which has been developed. The researcher then turns to other valid research techniques such as personal observation, questionnaires, and interviews to collect data, but often struggles with guilt feelings because of the failure to meet the expectation to produce "hard data." True EXPERIMENTAL DESIGN implies that one has complete control of subject assignment and treatment conditions. In this study random assignment and control of treatment groups was not possible.

REVIEW OF EXISTING SYSTEMS

In the past decade approximately ten on-line, direct-inquiry computer-based career guidance systems have been developed. Broadly defined, these are systems in which the user communicates directly with the computer's prestored text and files by means of a typewriter or visual display screen terminal for the purpose of receiving vocational and educational information designed to assist with personal career decision making. Each of the systems developed has had major differences in terms of the proposed conceptual design, the comprehensiveness of objectives, the amount of content, the hardware and software configuration used, the capabilities of the computer used, the cost per hour at the terminal, and the purpose for development of the system. It is not the intent of this report to delineate these differences, but rather to summarize the evaluative findings which have come out of prior field trials and operational use of these systems. These findings can easily be summarized in a series of statements:

1. Students accept computer-based guidance systems with enthusiasm and do not feel dehumanized by them (Chapman et al., 1973; Harris, 1972; Myers et al., 1971; Impelleteri, 1968). When provided with alternative ways to obtain vocational information, students will choose to use a computer system over books, audio-visual aids, and other traditional sources.

2. Parents accept computer-based systems with enthusiasm, reporting an increase in home conversation and involvement with career planning as a result of the student's use of such a system (Thompson, et al., 1971).

3. As a result of the use of computer-based systems, students report the following (Chapman et al., 1968):
    a. increasing awareness of the world of work;
    b. increased awareness of the relationship of self-characteristics (interests, aptitudes, values) to occupational choices;
    c. expansion of the number of vocational options being considered;
    d. greater ability to make vocational and educational decisions;
    e. increase in general occupational knowledge and in knowledge specific to the occupations or institutions reviewed at the terminal;
    f. engaging in exploratory behavior after use of the system such as reading, talking to counselors, parents, teachers, or workers in a given occupation; and sending away for additional material;
    g. receiving confirmation of career plans already made;
    h. receiving assistance with crystallizing career plans, if these were in a state of uncertainty;
    i. finding most of the information desired about occupations; and
    j. finding the computer a "fun" experience which they would recommend to a friend.

4. Relatively short use (2-4 hours) of a computer-based system causes a statistically significant increase in certain components (Awareness of Need to Plan and Knowledge and Use of Resources) of vocational maturity, as measured by the Career Development Inventory (Super et al., 1971) used in two studies (Harris, 1972; Myers et al., 1971).
5. Use of a computer-based system for collection of information about occupations causes a significant increase in cognitive occupational knowledge (Maola, 1974) as measured by three subscales on the Assessment of Career Development (American College Testing Program, 1973).
6. The computer alone as a delivery system is as effective as the counselor alone in two areas which have been studied, namely selection of courses for the next year in high school (Price, 1971) and provision of vocational guidance assistance to high-ability sophomores (Melhus, 1971). There is evidence, however, that combined use of counselor and computer for delivery of a guidance program has the highest potential for effecting maximum gain (Myers et al., 1972; Melhus, 1971).

GUIDANCE INFORMATION SYSTEM

At the time of this writing, approximately seven computer-based guidance systems operate in schools, colleges and agencies in the United States. Most of what is known about the effectiveness of these systems has been summarized in the preceding section. GIS, the latest of the computer-based systems, has now made its entrance into this environment. GIS is a sophisticated career information system consisting of six areas of content; these were described in material distributed to each site. The GIS system is a product of 13 years of development, from 1966-1979, which has been supported by the United States Office of Education and by Time Share Corporation, a subsidiary of Houghton Mifflin Company, and is intended for use by secondary level students, grades 7-12. The primary purpose of this report is to provide analysis of the Fall, 1979, GIS field trial and interpretation of the data collected on users and staff.

SITE CONTEXT

The basic evaluation plan called for collecting student/adult OPINION DATA at thirteen sites. Each site demonstrates unique characteristics, and it is necessary to differentiate between school and agency users. Differing missions and expectations of staff, clients and students resulted in GIS being utilized to a high degree in several locations, while others failed to capitalize on the opportunity. A list of the sites follows (see Appendix A).

Public School

1. Brewer High School
   Brewer, Maine
2. Old Town High School
   Old Town, Maine
3. Hodgdon High School
   Hodgdon, Maine
4. Southern Aroostook
   Vocational Education
   Houlton, Maine

Public Agency

1. Penobscot Consortium (CETA)
   Bangor, Maine
2. Aroostook Community Action
   Program (ACAP)
   Presque Isle, Maine
3. Bureau of Vocational
   Rehabilitation
   Augusta, Maine
4. Maine Job Service
   Bangor, Maine

5. Lewiston High School
Lewiston, Maine

6. Edward Little High School
Auburn, Maine

5. University of Maine at
Augusta and Kennebec CETA

6. Maine Youth Center
South Portland, Maine

7. Maine Correctional Center
South Windham, Maine

It is critical to readers of the report that complexity of data analysis by site be pointed out. The sample population encompassed adults with restricted reading abilities, physical handicaps and personality disorders. Also included were high school students who represent a more "normal" population, but also exhibiting a variety of learning problems, career interests and varied achievement levels. To draw conclusions that are generalizable to a normal population is difficult,and the data reported here must be reviewed in this context.

The design for this evaluation was developed through a series of meetings and visits to all field sites by staff of the Career Education Center. Additional comments regarding instrumentation were solicited from Social Science Research Institute staff and the contact person at each site. Rather than describe each of the 13 sites separately, the following three categories were designed to provide a general description of the context in which GIS was field tested.

PUBLIC SCHOOLS

A total of six (6) public schools are participating in the project and provide a good sample of different learning environments. Several of the schools are located in sparsely populated rural areas, two are in areas that may be classified as suburban, and two are in a large metropolitan area. The student population provides a mix of vocational, academic and general program participants. Faculty in these schools possess a level of training ranging from bachelor's to doctoral-level training. Preliminary estimates indicate that between 25 to 30 percent have completed training beyond the bachelor's degree.

POSTSECONDARY INSTITUTIONS

The University of Maine at Augusta is a community college which offers programs that lead to Associate of Arts Degrees in Graphic Arts, Liberal Studies, and Popular Music; Associate of Science Degrees in Architectural and Construction Technology, Business Careers, Business Administration, Criminal Justice, Medical Laboratory Science, Nursing, and Secretarial Science. Students may participate in programs which are directly transferable to universities and colleges which award baccalaureate degrees or may prepare them for employment after the completion of two years' study. The science degrees in Business Administration are offered by the University of Maine at Augusta primarily as programs for the part-time learner through late afternoon and evening courses.

Principal users of GIS were college students, but participants in the Displaced Homemakers Project and the Kennebec County CETA program had access to GIS. The environment is best described as an advanced learning institution and emphasis is on preparation for careers in two-year programs.

PUBLIC AGENCIES

Participating in the MOICC project are four state and federally funded service agencies that serve a wide range of clients. For example:

1. Maine Youth Center - a correctional facility mandated to rehabilitate wayward youth (ages 10 to 20) and provide guidance and educational services during this process.
2. CETA - a total of two sites are involved and encompass four counties. The primary mission is to provide educational and counseling services to youth (ages 16-21) and unemployed adults. The basic philosophy of the CETA site is to "effect meaningful improvements in the lives of low- and moderate-income people in Maine." Activities in the field of employment, job placement, health, housing and special services are a major part of the service.
3. Bureau of Vocational Rehabilitation - basic services related to vocational and occupational adjustment are provided to a wide range of clients. All accepted clients must have a documented physical, psychiatric or mental disability which constitutes a substantial vocational handicap and a reasonable chance of returning to gainful employment. Vocational Rehabilitation withdrew in October 1979 due to technical problems.
4. Maine Job Service - the agency services are primarily oriented to assisting adults who are unemployed and who are seeking employment. The clients range from age 16 to 65 as a norm.

These brief descriptions provide a general overview of the field sites where GIS was tested and used by various target groups. These different environments and populations must be kept in mind as the report is read and data interpreted.

SECTION 2

METHODOLOGY

The purpose of this impact study was to investigate the following questions:

1. Did the Guidance Information System (GIS) have an impact on career decision making of public school and agency users?
2. Did GIS have an impact on the educational/training decision making of public school and agency users?
3. Did GIS have an impact on the self-awareness of agency and public school users?
4. Did GIS have an impact on the job-seeking skills of public school and agency users?
5. Did GIS have an impact on the job-keeping skills of public school and agency users?
6. How did users evaluate the system the first time they used it?
7. How did users evaluate the system after a period of time?
8. What kind of impact did GIS have on the program and personnel at the sites (managerial impact)?

A MODIFIED-TIME SERIES design was utilized to assess the impact of the GIS system on the participating sites. The subjects were tested immediately after using the terminal and then six to eight weeks later. The public school sites were grouped and compared across schools in one

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Note: For an explanation of key items used in this report see the Glossary of Terms (Appendix L).

analysis. The agency SITES were also grouped and compared across sites. Data were also available from the sites, especially the public school sites, from the first sixth months, or pilot phase, of the project; these were added to the analysis. Four different measurements were made during the twelve months of the project.

A traditional experimental design was not utilized since the purpose of the project was to investigate the impact of GIS on the site and participants, not to see if GIS was a more effective career guidance program than that previously used at the site. The sites had volunteered to be involved in the program and the participants were volunteers. Since sites varied markedly on many variables, it would be impossible to select matched or equivalent groups. It was also felt that randomly selecting a control group at each site and delaying or denying career guidance to these individuals was not an educationally sound approach (see Appendix B).

SELECTION OF SUBJECTS

The site coordinators were asked to follow a QUOTA-SAMPLING procedure using RANDOM SELECTION. They were provided materials from the Evaluation Improvement Program (ETS, 1977) to aid them in selecting their sample, and the procedure was discussed at the July 1979 workshop sponsored by MOICC. They were asked to supply a total of 30 logs and post questionnaires wherever possible.

INSTRUMENTATION

Six different instruments were developed for the study. Two were designed to gather information about the characteristics of the site:

an Agency Characteristics Form for the six public agencies in the study and a Public School Form for the seven schools (see MOICC Preliminary Report, August, 1979).

To assess the immediate attitudes of the users, three forms were constructed. The first was a Public School Users Log on which students were asked basic demographic information, such as age, class, program and sex; what files they used; and six questions about the system. There was also a space for students to comment about GIS if they wished. The log was a one-page form (see Appendix C). The second form was an Agency Users Log (see Appendix D). It had similar format and questions, but the users had to circle highest grade in school completed rather than program of studies in school.

For those who did not directly use the computer terminal, a Batch Processing Reaction Form was used. Participants were asked to react to GIS as well as their understanding of the printout. They were also asked to give any comments they wished about GIS (see Appendix G).

In order to identify the type of career guidance exposure and program the students at the public schools had, a Public School Career Education Activities Form was developed. The students were asked demographic information such as age, sex, class and program as well as how often they took part in twenty-two (22) career education activities (see Appendix H).

Two post questionnaires were developed. There was a two-page form for agency users and a four-page form for public school users. There were twenty-five (25) common questions on both forms although the response

Format differed. Agency users were given three-point attitudinal scales (Yes--No--Unsure); the students utilized five-point scales (Strongly Agree to Strongly Disagree). The Public School Form called for participants to rate each file used, to check their educational aspirations, and to identify the impact of GIS on career planning. The public School Users Post Questionnaire is found in Appendix E. The Agency Users Post Questionnaire is included in Appendix F.

PROCEDURES

Data collection in the initial field testing phase of the MOICC study took place between May 4 and June 15, 1979. The second field testing took place between November 1, 1979 and January 15, 1980. Each site was mailed a packet of instruments with a statement of purpose of the impact study, as well as directions for collecting the data. The forms were revised for the second field testing based upon the information given by site coordinators in the workshop in July. The revised instruments were field tested and critiqued by participants and the site coordinator at one site.

It was stressed that the data was to be treated in confidence and was to be used to write a report on the impact of GIS upon users and counseling programs, not to evaluate individual counselors, teachers or administrative personnel. Also, responses to all questionnaires were to be anonymous. The site coordinators were requested not to have the respondents use names but to have them use some type of ID code, such as the last four digits of the subject's social security number so that the various forms could be matched for each user.

DATA ANALYSIS

The data were key punched directly from the questionnaire forms. The statistical program used was the Crosstabs, Frequencies, and One-Way Analysis of Variance programs from the Statistical Package for the Social Sciences--commonly known as "SPSS" (Nie et al., 1975). The data were processed by the Computing and Data Processing Service of the University of Maine.

THE SAMPLE

The number of participants completing the different forms used are listed in Table 1. One hundred sixty-three participants completed the Public School Users Log, 123 the Activities Form and 187 the Public School Post Questionnaire. One hundred and nine completed either the Agency Users Log or the Batch Processing Reaction Form while 91 completed the Agency Post Questionnaire.

CHARACTERISTICS OF AGENCY USERS

There were 91 users who completed the post questionnaire. The demographic characteristics of the group are summarized in Table 2. The MEAN age for the agency users was 25.14, the median 20.93, and the mode 18. Forty-six percent were male and 52 percent were female (2% did not check this category). The mean grade completed was 12.04, the MEDIAN 11.9 and the MODE 12. There were SIGNIFICANT differences between the five sites on age and educational level. The participants from the Maine Job Service had the most education on the average while the sample from Penobscot Consortium had the lowest level. The participants from UMA had the highest mean age, 39.86, while the group from the Penobscot Consortium the lowest,

TABLE 1

SAMPLE IN SECOND PHASE OF MOICC STUDY COMPLETING QUESTIONNAIRES

SITE	PS USERS LOG	AGENCY USERS LOG	ACTIVITIES FORM	BATCH PROCESSING	AGENCY POST Q	PS POST Q
1) Hodgdon HS	25	0	0	0	0	30
3) Houlton HS	27	0	27	0	0	28
4) Houlton SAVE	10	0	0	0	0	1
5) Aroostic CAP CETA	0	0	0	18	10	0
6) Old Town HS	29	0	28	0	0	29
7) Brewer HS	0	0	24	0	0	19
8) Penobscot Consortium CETA	0	0	0	34	34	0
9) Maine Job Service	0	22	0	0	12	0
10) University of Maine, Augusta	0	14	0	0	14	0
11) Lewiston HS	18	0	20	0	0	25
12) Edward Little High School	28	0	23	0	0	33
13) Maine Youth Center	24	0	0	0	0	22
14) Maine Correctional Cntr.	24	21	0	0	21	0
UM Coded	2					
TOTAL	163	57	123	52	91	187

TABLE 2

Age, Sex and Educational Level of Agency Users

		AGE		SEX		EDUCATIONAL LEVEL	
AGENCY	N	MEAN RANGE	SD	M	F	MEAN RANGE	SD
AROOSTOOK COMMUNITY ACTION PROGRAM (ACAP)	10	22.77 19-29	3.77	3	7	13.25 12-16	1.89
PENOBSCOT CETA	34	19.72 16-45	5.04	12	20	11.30 9-18	2.00
MAINE JOB SERVICE	12	31.00 19-50	9.94	6	6	14.22 12-16	1.85
UNIVERSITY OF MAINE AUGUSTA (UMA)	14	39.86 18-58	12.37	2	12	12.57 10-16	1.90
MAINE CORRECTIONAL CENTER	21	21.23 18-25	2.16	19	2	10.70	1.94
TOTAL	91	25.14 16-58	10.07	42	47	12.04 9-18	2.54

SD = STANDARD DEVIATION
M = MALE
F = FEMALE
N = NUMBER OF USERS

19.72. There were also significant sex differences between sites. The Maine Correctional Center had predominately a male sample while Penobscot CETA, UMA, and ACAP had more female users than male.

FREQUENCY OF USE OF FILES BY AGENCY USERS

The use frequency of different files by the agency group is reported in Table 3. Most users utilized the national occupational file, and most uses were of that file. Eighty-five percent used the national occupational file while 35 percent used the Maine Occupational file. Three of the files were only used by three of the 91 users. These were the Armed Services Occupational File, the Graduate School File and the Maine Vocational Technical School File. The two and four-year college files were used by thirteen and fourteen percent of the sample. It should be noted that the usage cited is for the random sample of users selected to participate in the impact study and might not represent the total pattern of file use by all those from agencies who used GIS. Counselors might not have realized the extreme use of the OCCU file as this sample was heavily biased toward job information in the agency group.

There were differences between the agencies in the number of times clients used the terminal. The use varied from one to twelve times. The mode was 1, the mean 1.9 and the median 1.40. Half of the clients only used the terminal one time. The participants at the Maine Correctional Center had the highest level of usage while University of Maine at Augusta, Aroostook Community Action Program and Penobscot CETA had the lowest level (see Table 4).

TABLE 3

FILES USED BY AGENCY USERS

FILE (n=91)	NUMBER OF TIMES USED	PERCENT OF SAMPLE USING FILE
OCCU	77	84.6
MEOC	32	35.2
ASOC	3	3.3
COL4	13	14.3
COL2	12	13.2
GRAD	3	3.3
AIDS	5	5.5
MEVT	3	3.3

Definition of Terms:

OCCU--Occupational Information File

MEOC--Maine Occupational Information File

ASOC--Armed Services Occupational File

COL4--Four-year College Information File

COL2--Two-year College Information File

GRAD--Graduate School Information File

AIDS--Financial Aid Information File

MEVT--Maine Vocational Technical Institute Programs

TABLE 4

NUMBER OF TIMES AGENCY SAMPLE USED GIS

SITE	MEAN	SD	RANGE
Aroostook Community Action Program	1.55	0.73	1-3
Penobscot CETA	1.56	0.84	1-5
Maine Job Service	2.30	2.11	1-8
University of Maine at Augusta	1.54	1.29	1-5
Maine Correctional Center	2.67	2.89	1-12

CHARACTERISTICS OF PUBLIC SCHOOL USERS

There were 187 youths who completed the Public School Users Post Questionnaire. The age distribution of the sample is found in Table 5. The range was from 13 to 19 with the mean 16.08, the mode 17 and the median 16.20.

There were 105 males (56 percent) and 81 females (44 percent) in the sample. The distribution by class is given in Table 6. The largest group were seniors (31 percent). The freshmen and juniors were each about one-fourth of the sample; the sophomores had the lowest representation (16 percent).

The distribution by program is presented in Table 7. Nearly one-half of the group were in college-preparatory programs, 20 percent in general programs, 11 percent in commercial or business curriculum and 8 percent in the vocational area.

FREQUENCY AND USE OF FILES BY PUBLIC SCHOOL USERS

The use frequency of different files by the public school group is reported in Table 8. The majority of students, 87 percent,used the Occupational Information File. The four-year college and two-year college files were next in frequency used (34 and 25 percent). The Graduate School File was least used (5 percent). The Financial Aid File was only used by 13 (7 percent) of the students; the Armed Services Occupational File by 15 (8 percent) and the Maine Occupational File by 24 (13 percent).

The use of the terminal ranged from one to twenty-four times. The mode was one and the mean, 2.76. There were significant differences between sites: Old Town students had the highest mean, 5.65, while Hodgdon had the lowest 1.00 (Table 9).

TABLE 5

AGE DISTRIBUTION OF PUBLIC SCHOOL USERS

AGE	ABSOLUTE FREQUENCY	RELATIVE FREQUENCY %	ADJUSTED %
13	1	0.5	0.5
14	19	10.2	10.3
15	31	16.6	16.8
16	59	31.6	32.1
17	62	33.2	33.7
18	11	5.9	6.0
19	1	0.5	0.5
Missing	3	1.6	-
	187	100.0%	100.0%

TABLE 6

CLASS OF PUBLIC SCHOOL SAMPLE

CLASS	ABSOLUTE FREQUENCY	RELATIVE FREQUENCY	ADJUSTED
		%	%
FRESHMEN	48	25.7	26.7
SOPHOMORE	29	15.5	16.1
JUNIOR	46	24.6	25.6
SENIOR	57	30.5	31.7
MISSING	7	3.7	-
	187	100.0%	100.0%

TABLE 7

PROGRAM OF STUDIES OF PUBLIC SCHOOL SAMPLE

PROGRAM	ABSOLUTE FREQUENCY	RELATIVE FREQUENCY %	ADJUSTED %
COLLEGE PREP	87	46.5	52.1
GENERAL	40	21.4	24.0
VOCATIONAL	15	8.0	9.0
COMMERCIAL/ BUSINESS	21	11.2	12.6
OTHER	4	2.1	2.4
MISSING	20	10.7	-
	187	100.0%	100.0%

TABLE 8

FILES USED BY PUBLIC SCHOOL USERS

GIS FILE	NUMBER OF TIMES USED	PERCENT OF SAMPLE USING FILE
OCCU	162	86.6
MEOC	24	12.8
ASOC	15	8.0
COL 4	63	33.7
COL 2	47	25.1
GRAD	10	5.3
AIDS	13	7.0
MEVT	11	5.9

N = 187

TABLE 9

NUMBER OF TIMES STUDENTS USED THE TERMINAL, BY SITE

SITE	N	MEAN	STANDARD DEVIATION	RANGE
HODGDON	30	1.00	0.00	1-1
HOULTON	25	2.24	1.66	1-8
OLD TOWN	26	5.65	5.53	1-24
BREWER	11	2.18	1.53	1-6
LEWISTON	21	1.58	0.20	1-3
AUBURN	32	2.03	1.53	1-7
MAINE YOUTH CENTER	21	3.76	1.86	1-8
TOTAL	166	2.76	3.07	1-24

DIMENSIONS OF THE PUBLIC SCHOOL CAREER EDUCATION PROGRAM

The participants were asked to fill out a Career Education Activities Form. One hundred and twenty-three students filled out this form at five different sites. Fifty-four were male and sixty-eight female. They ranged in age from 14 to 18. The mean was 16.31, the mode 17 and the median 16.42. Fifteen percent were freshmen, 11 percent sophomores, 33 percent juniors and 41 percent seniors. Fifty-nine percent were in college preparation programs, 15 percent in general, 11 percent in vocational, nine percent in commercial/business and four percent in other. It is interesting to see the types of activities in which student users of GIS report that they "never" participated:

(1) About 70 percent have never taken part in a school supervised work experience program.

(2) About two-thirds report that they never have listened to the parents of other students talk to the class about what they do in their work. About the same percentage stated that they had never talked with the class about what was learned regarding careers or field trips. About 55 percent have never attended a career fair or gone on field trips to businesses or industries to learn what people do on their jobs; 58 percent have never taken tests to find out how much they know about different jobs and what people in them do; and 57 percent had never received personal help from people at school in finding a paid job.

(3) Nearly fifty percent have not used T.V., tapes or filmstrips to learn about jobs; a similar proportion had never listened to workers talk to the class about the work they do; and a like number had never taken material home so that their parents could help them learn about jobs and what work they (the students) might want.

The results by activity item are presented in Table 23 and will be discussed more fully in Section 3.

SUMMARY

A modified time-series design was used to assess public school and agency user reactions to a computer information system, GIS data, and program impact. Information was sought in this study to address the feasibility of adopting GIS as the statewide model for computerized career information. A total of 91 agency and 187 public school users responded to a Post-Use Questionnaire. Their responses were analyzed and the results reported in Section 3.

Students also reported on career education activities. Since the instrument was a self-report inventory, some students may have been careless or poorly motivated to complete the form. It is not likely that schools would sponsor career fairs daily, weekly or once a month. The responses, however, do provide an insight into the type of career education activities utilized or not utilized in the participating schools. Since some students were in vocational programs, they might have had more opportunities to talk with people in jobs and visit with workers to learn what they do on their jobs. The energy crunch and tight budgets probably curtail the extensive use of field trips.

SECTION 3

RESULTS

The results of the second phase of the MOICC project are presented in four elements. The first element consists of the responses of the agency users to the Agency-Users Log, the Batch-Processing Reaction Form and the Agency Post-Questionnaire. The second element contains the responses of the public school students on the Users Log, Post Questionnaire and Career Education Activities Index. In the third element the responses of the agency and public school users are compared. The last element includes a comparison of the impact in Phase 1 of the study with the impact found in Phase 2.

AGENCY USERS REACTION TO GIS

Three agencies had their clients work directly on the terminal, The Maine Job Service (22), University of Maine at Augusta (14), and Maine Correctional Institute (21). All individuals stated that the purpose of GIS was clear to them. Eighty-eight percent stated that directions for using the GIS Guide and Summary Sheet were easy to read and follow.

There were three questions which were asked to elicit an immediate evaluation of the system. No one disliked using the system, eighty-eight percent stated they enjoyed it and twelve percent checked "it was okay." Forty-seven percent reported that they received all the career information they needed. Twenty-six percent stated they needed more and twenty-three percent indicated they were not sure.

None of the respondents felt GIS was a waste of time or no help at all. A quarter of the group indicated that the experience helped them make vocational and educational decisions. Sixty percent stated that GIS was useful and they learned helpful things. As a result of using GIS, the agency participants:

- planned to talk with counselors (40 percent),
- planned to talk with parents (19 percent),
- planned to talk with teachers (19 percent),
- planned to talk with people in occupations (56 percent),
- planned to write for catalogs and information (32 percent),
- planned to get more books and materials on the topic (28 percent), and
- planned to use other sources--for example, write to relatives for help with plans; work with two year college file; think about a job; check on a job; and go to school (7 percent).

Respondents were provided space to write additional comments if they wished. Nineteen users wrote comments and about half of the comments dealt with their personal reactions to the system. For example, two "liked the machine"; "very helpful, excellent services for those interested"; "enjoyed it"; using the computer was very helpful". The other comments related to career decision making (for example, I would like more information; the GIS system has helped me to choose between colleges and to find one appropriate for myself; I have to think about a few things; the computer helped greatly in specifying and understanding my choices).

BATCH PROCESSING--IMMEDIATE REACTION TO GIS

The Batch Processing Form was completed by 52 individuals from two agency sites. Their initial evaluation of the process was positive. The majority (96 percent) of the individuals stated that the purpose of using the computer service was clear to them. About 90 percent of the group used the GIS Guide and filled out the Summary Sheet. There were only seven users (15 percent) who reported that they had a problem doing this. The users overwhelmingly reported they understood the GIS printout (96 percent). Respondents reported that they were helped in interpreting the printout by a counselor.

There were three questions asked to elicit an immediate evaluation of the system. Sixty-seven percent reported they enjoyed using the GIS system; 31 percent said it was okay, and two percent disliked it. Thirty-nine percent stated they got all the information they needed; 43 percent wanted more, and 18 percent were not sure. Only two percent (one user) felt the system was a waste of time; twenty-six percent said they were not sure, 53 percent said it was helpful and they learned useful things, while 20 percent checked it did help them make vocational and educational choices.

The respondents were also asked what they planned to do as a result of using the GIS system. Twenty-six (50 percent) said they would talk with their counselor; 13 (25 percent) would talk with people in the occupation in which they were interested; 12 (23 percent) planned to write for school catalogs and information; eight (15 percent) intended to get more books and materials to read on the topic; three (6 percent) were going to talk with their parents and one (2 percent) was going to talk with a teacher. Twenty-one percent checked "other" (for example, keep it in mind; explore it more; too early to tell; use computer again; use computer more; request additional information; do it again; talk with my husband). They were also asked to write any comment they wished. Four participants responded and cited: (talk more with my employability counselor; would like to work more with OCCU; need to try again--experiment; excellent; but each person should be able to sit at the terminal to process his own data rather than have it sent after being processed by someone else).

AGENCY USERS' POST QUESTIONNAIRE--EVALUATION OF GIS

The agency users were asked to evaluate twenty statements relating to different dimensions of GIS. The results are presented in Table 10. There were eight items which asked the users to evaluate the system. Ninety-one percent reported it was fun to use the computer terminal while 80 percent stated it was a pleasant personal experience. Only two percent indicated that they felt GIS was a very cold, impersonal experience and three percent, that people should always have help from a human, never a computer.

Four percent of the sample checked that GIS was a waste of time while 92 percent disagreed and felt it was a valuable experience. Seventy-eight percent indicated that GIS helped them enough that they thought all people should have the same opportunity. Sixty-nine percent reported that GIS provided them with the type of information they wanted while ten percent said it did not. Eighty-nine percent stated that the GIS information was easy to understand.

AGENCY USERS' POST QUESTIONNAIRE--CAREER DECISION MAKING

There were six statements on the Post Questionnaire relative to career decision making. Eighty-eight percent felt that the computer was a great way to get information to help with choosing occupations. Three percent said no and nine percent were unsure. Eighty percent checked "yes"

TABLE 10

Agency Users Post Questionnaire Responses

CATEGORY AND ITEM	YES	NO	UNSURE	MISSING
EVALUATION				
It was fun to use the computer terminal.	80 90.9	5 5.7	3 3.4	3
Using GIS was a pleasant personal experience.	74 80.2	4 4.4	13 14.3	1
Using GIS was a cold, impersonal experience.	2 2.3	77 88.5	8 9.2	4
People should always have help from a human, never a computer.	3 3.3	63 70.0	24 26.7	1
Using GIS was a waste of time; it didn't help me at all.	4 4.4	83 92.2	3 3.3	1
GIS helped me enough that I think all people should have the same opportunity I did.	69 77.5	3 3.4	17 19.1	2
GIS provided me with the type of information I wanted.	61 68.5	9 10.1	19 21.3	2
The GIS information was easy to understand.	79 88.8	4 4.5	6 6.7	2

TABLE 10 CONTINUED

CATEGORY AND ITEM	YES	NO	UNSURE	MISSING
CAREER DECISION MAKING				
The computer is a great way to get information to help with choosing occupations.	79 87.8	3 3.3	8 8.9	1
Using GIS helped me to learn alot about occupations.	73 80.2	11 12.1	7 7.7	0
I did not learn anything new about how to make career decisions by using GIS.	10 11.2	64 71.9	15 16.9	2
I read books and pamphlets about jobs after using GIS.	38 42.2	46 51.1	6 6.7	1
GIS helped me feel good about my career plans.	44 51.2	17 19.8	25 29.1	5
I was confused or puzzled about my job plans after using GIS.	14 15.4	66 72.5	11 12.1	0
EDUCATIONAL DECISION MAKING				
Using GIS helped me to make the educational plans I need to make.	32 36.8	22 25.3	33 37.9	4
GIS helped me select a specific school or program for further education or training.	23 26.1	47 53.4	18 20.5	3

TABLE 10 CONTINUED

CATEGORY AND ITEM	YES	NO	UNSURE	MISSING
SELF AWARENESS				
I learned a lot about myself using GIS.	30 33.7	27 30.3	32 36.0	2
Using GIS helped me to learn more about my values as they relate to career planning.	55 61.8	16 18.0	18 20.2	2
Using GIS helped me to learn more about my interests as they relate to career planning.	63 71.6	12 13.6	13 14.8	3
Using GIS helped me to learn about my abilities as they relate to career planning.	50 56.8	20 22.7	18 20.5	3

to "using GIS helped me to learn alot about occupations." Only 11 percent stated that they did not learn anything new about how to make career decisions by using GIS. Slightly over 40 percent indicated that they read books and pamphlets about jobs and training after using GIS. About half of the users stated GIS helped them feel good about their career plans. It should be noted that fourteen (15.4 percent) of the agency users checked that they were confused or puzzled about their job plans after using GIS. Responses in the "unsure" category may indicate that users have not formulated clear career or educational plans. Intensified career counseling services would certainly be needed for these respondents.

The users were also asked whether using GIS helped them to make a career or job decision. Forty-three or 51 percent of the 91 subjects circled "yes". If they circled "yes", they were asked in what way or how. Thirty-six of the 43 wrote in comments. The themes of these comments and examples of each are included in Table 11. Five major themes were identified. They were:

- GIS caused individuals to take specific career or job actions,
- GIS helped them to confirm their career plans,
- GIS provides information that would help them in their career plans,
- GIS helped them to narrow their career choice, and
- GIS opened opportunities and new areas they had not thought of before.

AGENCY USERS' POST QUESTIONNAIRE--EDUCATIONAL DECISION MAKING

There were two statements on the survey concerning the impact of GIS on educational or training decisions. Thirty-seven percent of the agency users felt that GIS had helped them to make educational plans. Only twenty-five percent felt that it didn't and 38 percent were unsure. Slightly

TABLE 11

WAYS GIS HELPED AGENCY USERS MAKE CAREER OR JOB DECISIONS

THEME	EXAMPLES
Specific Action	I am going to work for the federal government as an inspector. Gone into small engine class. College Got me to think. Career decision is to get more experience. I have decided to go to school and better my job opportunities and income.
Confirmation of Plans	Decided to continue and pursue mechanics career. I had a pretty good idea about what I wanted to do but it convinced me. Nursing is what I want and GIS established it more. It reassured myself that I was in an appropriate line of work.
Provided Information	Gave me all the information I needed in the educational requirements and job description. Gave me a basis for starting my search. It helped me to determine what types of jobs are concerned with or related to my interests and goals. It showed me what I'm good at. I have the information about the job I was interested in.
Helped Narrow Choice	It narrowed my choices down to two or three after getting information about alot of different

TABLE 11 CONTINUED

THEME	EXAMPLES
Helped Narrow Choice (Cont.)	jobs. By narrowing down the choices, I know now that I don't want to do certain jobs. The computer helped me to narrow down the jobs in my areas of interest. It told me how realistic my ambitions are in Maine. Mainly by confirming my impressions of my own abilities and outlining specific options within these lines.
Opened Opportunities	By showing me different jobs I never heard of or thought about before. Exposed me to new careers I didn't know were good for me. It introduced me to the wide field of work that interests me. It has helped me to come to understand some basic values in work and education. Helped me to look for a goal.

less, twenty-six percent reported that GIS helped them select a specific school or program for further education or training. They were also asked later in the survey whether GIS helped them to make a decision about further education and training. Forty (47 percent) circled "yes" and 31 of these wrote comments. The themes and examples of the comments are included in Table 12. The four themes identified were:

- GIS confirmed their educational or training decision.
- GIS provided them useful information which will help them in their decision.
- GIS stimulated their thinking on education and/or training.
- GIS helped them to make specific educational or training decisions.

AGENCY USERS' POST QUESTIONNAIRE--SELF-AWARENESS

There were five items concerned with the impact of GIS on self-awareness, 4 statements to react to and 1 question. Slightly over a third of the participants stated that they learned a lot about themselves using GIS. Sixty-two percent felt that using GIS helped them to learn more about their values as they related to career planning. Seventy-two percent reported that GIS helped them to learn more about their interests as they relate to career planning while 57 percent indicated that GIS helped them to learn about their abilities as they relate to career planning.

If Agency Users were asked whether GIS helped them understand more about themself and if so, in what ways or how? Forty (47 percent) of the sample said "yes". Thirty-six included written comments. The themes and examples of the comments are included in Table 13. It should be noted that more individuals circle yes when the questions ask about specific dimensions of self awareness than when overall self-awareness is assessed.

TABLE 12

WAYS GIS HELPED AGENCY USERS TO MAKE EDUCATIONAL OR TRAINING DECISIONS

THEME	EXAMPLES OF COMMENTS
Confirmed Decisions	Was already heading in that direction, now have a commitment to stick it out. Education pays! I need my diploma.
Provided Information	It showed me different schools that had the courses I wanted. Yes, through lists and distributions of jobs and the training needed to do the job. By providing information about schools and aids. It told me what education or training was required for certain positions. I know now what courses I need to achieve my goal.
Stimulated Thinking	Made me realize that I need more education. It showed me that you need some training for lots of jobs. Seeing different fields that are open to me for further exploration. Will probably go to college. In the future, I would like to attend a VTI to further my career.
Specific Action	I have decided to go to vocational school. Yes, I am going for my diploma thanks to GIS. Yes, I am in the process of applying for admission to college. Try to enroll in computer-programmer school.

TABLE 13

WAYS GIS HELPED AGENCY USERS UNDERSTAND MORE ABOUT THEMSELVES

THEME	EXAMPLES OF COMMENTS
Clarified Their Understanding	It helped me to define my interests and how to apply them toward a career. What I need to do to make what I want for myself. Clarified my own values as they relate to my interests vs. abilities. What I can do! It helped me to define my interests and how to apply them toward education or a job. Made me understand that I really am not as experienced in any field as I thought I was.
Expanded Understanding Built Confidence	It told me what I am good at and it is true. Yes, helped me deal with building confidence. It has helped me understand more of my abilities. I learned more things about the things I like to do and never really thought about. Personal things I never took time to realize on my own. Learned some abilities and how to use them on a job. I realized I had more options than I have assumed.

Two major themes were identified:

- GIS helped clarify their self-awareness
- GIS helped to expand their self-awareness and build their self confidence.

AGENCY USERS' POST QUESTIONNAIRE--JOB-SEEKING SKILLS

The agency users were asked if GIS helped them to understand more about how to get a job. Forty (46 percent) of the group stated that GIS helped them. Twenty-six included written comments. The themes and examples of comments are listed in Table 14. Two major themes were identified:

- GIS provided relevant knowledge about how to get a job.
- GIS helped them identify appropriate job seeking strategies.

AGENCY USERS' POST QUESTIONNAIRE--JOB-KEEPING SKILLS

Twenty of the 91 (22 percent) users indicated that GIS helped them with job keeping skills. Eleven of the group wrote comments. The major theme identified indicated that GIS helped them have a better knowledge of job-keeping skills by increasing their knowledge about jobs, job roles and requirements. Examples are as follows:

- By knowing what the employer wants.
- I understand the duties of the job fully--that should keep the job.
- The more qualified and interested you are in a job, the better your chances are in keeping it or advancing in that field.
- That's a little more difficult to answer, however, if by using the computer the person finds an area and interest, his chances of liking and thus keeping the job are much greater.

TABLE 14

WAYS GIS HELPED AGENCY USERS UNDERSTAND MORE ABOUT HOW TO GET A JOB

THEME	EXAMPLES OF COMMENTS
Provide Relevant Knowledge	The program listed necessary education abilities, areas of employment as well as employment potential. Such as where to look about information about jobs. Where to look. Where to get it and where to find it and the people.
Helped Identify Job Seeking Strategies	Has helped me to realize what I need for education in order to get a certain job. What I need for qualifications. Try to find a career with an open field that relates to your interests and educational background. It showed me that you need different types of training and education. I've learned how to prepare myself for the job I seek. When you know which career you want you are more determined to look for it.

AGENCY DIFFERENCES

There were differences on four of the 24 items on the questionnaire in how the agency users perceived the impact of GIS. These four items related to the impact of GIS on self-awareness, job-seeking skills, job-keeping skills and educational planning. A CHI SQUARE of 11.645 was computed when the item "Has GIS helped you understand more about yourself?" was crosstabulated by agency. The chi-square was significant at the .05 level. This statistic indicates that there is a significant difference in how clients of different agencies viewed this item. Only 27 percent of the Penobscot CETA group said "yes" as compared to 72 percent of the Maine Correctional group, 64 percent of UMA, 45 percent of Maine Job Service and 40 percent of ACAP.

A chi square of 15.04 was computed on the distribution of responses to the job-seeking skills item by agency and was significant at the .01 level. Eighty-four percent of the Maine Corrections group said "yes" GIS helped in developing job-seeking skills, in contrast to a low of 27 percent from the Maine Job Service, 30 percent from ACAP, 36 percent from Penobscot CETA and 43 percent of UMA. The same pattern was true of job-keeping skills. The chi-square was 28.64 and was significant at the .001 level. Sixty-five percent of the Maine Correctional group circled "yes" in contrast to 21 percent of UMA, eight percent of Maine Job Service, six percent of Penobscot CETA and ten percent of ACAP.

A chi-square of 21.65 was computed for the item "Using GIS helped me to make the educational plans I need to make." Two-thirds of the Maine Correctional group agreed, about one-third of the UMA and Penobscot CETA groups and about 10 percent of the ACAP and Maine Job Service groups agreed.

The differences may in part reflect the characteristics of the clients of each agency. The inmates of the Maine Correctional Center are more enthusiastic about the values of the GIS system, but they are more remote from the problems facing those active in the job market. This is especially true in terms of job-seeking and job-keeping skills. The inmates presumably have more time than others to reflect on what they might or would like to do.

SEX DIFFERENCES

Even though there were significant differences between the proportion of males and females at the agencies, sex of the respondents was not a significant variate in the rating of GIS. There was a significant difference between males and females on only one of the 24 items, "GIS helped in developing job-keeping skills," (chi-square = 4.55, $p<.05$). Thirteen percent of women checked "yes" as compared to 34 percent of the men.

AGE DIFFERENCES

Although there were significant differences between the age distributions of clients at the agency sites, age was not an important variate. There were, however, significant differences among age groups on four of the 24 items. A chi-square of 14.56 ($p<.001$) was computed for the item "People should always have help from a human, never a computer." Users aged 21 or under tended to prefer human help much more than users 22 and older. A chi-square of 5.97 ($p<.05$) was computed for the item "I read books and pamphlets about jobs and training after using GIS." A higher proportion of users 22 and older said that they read books (51 to 33 percent).

GIS was more helpful in developing self-awareness with the 22 and older group than the 21 and younger group. Sixty-three percent of the older group checked "yes" as compared to 33 percent of the younger group (chi-square = 6.21, $p<.05$).

GIS was more helpful to the younger group in helping them with job-seeking skills. Sixty-four percent of the younger group, but only 17 percent of the older group stated that GIS helped with these skills (chi square=6.26, $p<.05$)

EDUCATIONAL LEVEL

There were differences between the sites on the educational level of the users; however, this was not significant in understanding the variance of the ratings. There were no significant differences on responses to the twenty-four items when broken down by the educational level of the participants.

PUBLIC SCHOOL USERS--REACTION TO GIS

Seven secondary school sites had their students use the terminal and complete the Public School Users Log. Ninety-eight percent of the users stated that the purpose of using GIS was clear to them. Eighty-nine percent found the directions for using the GIS Guide and Summary Sheet clear to them.

There were three questions which were asked to elicit immediate reactions to the system. Seventy-four percent checked that they enjoyed using GIS, 24 percent said it was okay. Only one of the students checked "disliked it."

Fifty-four percent indicated that they got the type of information needed from GIS; 25 percent claimed they needed more and 21 percent were not sure.

Only four of the 163 students completing the log felt that GIS was a waste of time or no help at all; only three were not sure on this item. One hundred(63 percent) reported that GIS was useful and that they learned helpful things, while 24 percent (38 students) said that GIS helped them make their vocational and educational choices.

As a result of using GIS the public school users indicated that they:

- would talk with their counselor (33 percent);
- would talk with their parents (49 percent);
- would talk with their teachers (12 percent);
- would talk with people in the occupations (37 percent);
- would write for school catalogs and information (33 percent);
- would get more books and materials to read on the topic (33 percent); and
- would do "other" things such as get more training, talk with girlfriend, use the GIS for more information, write for applications, look for a full-time job, enter service to go to school, and write to the addresses they gave to you on the sheets (14 percent).

Users were also given an opportunity to write personal comments about GIS. A thematic analysis of the statements with examples of comments is found in Table 15. Five major themes were identified. The majority of statements related to the first two themes. GIS was perceived by the users to be a useful system and it was motivational. The initial exposure aided students in making career or educational decisions or confirmed their decisions. There were very few written negative comments about the system. Negative comments pertained to specific situations, such as GIS should have something about liberal arts programs.

TABLE 15

THEMATIC ANALYSIS OF COMMENTS FOUND ON THE PUBLIC SCHOOL USER'S FORM

THEME	EXAMPLES
Helpful, Useful System	Very helpful, I thought it helped me a whole lot, GIS was very helpful. I'm glad I used it. Very good system. It helped me alot. I like the GIS and it was very helpful. I really think this system is of value in giving people like me with no idea whatsoever of where they want to go or what they want to do, ideas.
Fun, Motivational	It was fun. I thought it was great and I want to use it again. I think more people should be able to use it. I enjoyed working with GIS.
Decision, Actions	Talk with some people about the career. Check pamphlets. Filled out applications for schools. Think about other occupations.
Criticisms	I think the GIS should have something about Liberal Arts type programs. I wish it could give me more information on a specific course of study at the school I was interested in. All the codes were confusing. The AIDS file needs help.
Confirmed Career Plans	I was already set on engineering and GIS made my interests deeper.

PUBLIC SCHOOL USERS POST QUESTIONNAIRE

The public school participants were asked to evaluate 20 statements relating to different dimensions of GIS. The results are presented in Table 16.

There were eight items which asked users to evaluate different dimensions of GIS. About 91 percent of the users agreed that it was fun to use the computer terminal (45 percent strongly agreed; 46 percent agreed). Only three (2 percent) of the sample disagreed.

Overall, students found using GIS a pleasant personal experience. Twenty-four percent strongly agreed, 55 percent agreed to this statement. Only ten (6 percent) of the students disagreed to this item.

Twenty-five (14 percent) of the users felt that using GIS was a very cold impersonal experience; 12 percent were unsure and 74 percent disagreed. Twenty-four (13 percent) of the students indicated that students should "always have help from a human, not a computer." Sixty (31 percent) were unsure. Ninety-seven (54 percent) disagreed.

Forty-eight (27 percent) indicated that GIS was a waste of time; it didn't help them at all, but two thirds felt otherwise. Seventy-eight percent of the students stated that GIS helped them enough that they thought all students should have the same opportunity they did. Seventeen percent were unsure and six percent disagreed.

Only 13 of the 187 students found that the information from GIS was not easy to understand. Seventy-nine percent either strongly agreed or agreed that the information from GIS was easy to understand. Sixteen of the 187

TABLE 16

RESPONSES TO PUBLIC SCHOOL USERS POST QUESTIONNAIRE

CATEGORY AND ITEM	MISSING	STRONGLY AGREE	AGREE	UNSURE	DISAGREE	STRONGLY DISAGREE	MEAN/ STANDARD DEVIATION
EVALUATION							
It was fun to use the computer terminal	6	81 44.8	83 45.9	14 7.7	3 1.7	0 0.0	1.663 0.693
Using GIS was a pleasant experience	5	43 23.6	100 54.9	29 15.9	8 4.4	2 1.1	2.044 0.820
Using GIS was a very cold impersonal experience	8	15 8.4	10 5.6	21 11.7	67 37.4	66 36.9	3.888 1.208
Students should always have help from a human not a computer	6	6 3.3	18 9.9	60 31.1	66 36.5	31 17.1	3.541 0.997
Using GIS was a waste of time; it didn't help me at all	6	15 8.3	33 18.2	11 6.1	45 24.9	77 42.5	3.751 1,382
GIS helped me enough that I think all students should have the same opportunity	6	78 43.1	63 34.8	30 16.6	8 4.4	2 1.1	1.856 0.926
GIS provided me with the type of information I wanted	7	44 24.4	99 55.0	21 11.7	11 6.1	5 2.8	2.078 0.924

TABLE 16 CONTINUED

CATEGORY AND ITEM	MISSING	STRONGLY AGREE	AGREE	UNSURE	DISAGREE	STRONGLY DISAGREE	MEAN/ STANDARD DEVIATION
EVALUATION							
The information from GIS was easy to understand	7	51 28.3	92 51.1	24 13.3	10 5.6	3 1.7	2.011 0.891
CAREER DECISION MAKING							
The computer is a great way to get information to help with choosing occupations	7	88 48.9	56 31.1	20 11.1	11 6.1	5 2.8	1.828 1.035
Using GIS helped me to learn a lot about occupations	5	46 25.3	81 44.5	27 14.8	18 9.9	10 5.5	2.258 1.110
I did not learn anything new about how to make career decisions from GIS	9	8 4.5	29 16.3	33 18.5	68 38.2	40 22.5	3.579 1.138
After using GIS, I began using books and other materials in the guidance library that I would have ignored	10	26 14.7	56 31.6	39 22.0	48 27.1	8 4.5	2.751 1.141

TABLE 16 CONTINUED

CATEGORY AND ITEM	MISSING	STRONGLY AGREE	AGREE	UNSURE	DISAGREE	STRONGLY DISAGREE	MEAN/ STANDARD DEVIATION
CAREER DECISION MAKING							
GIS helped me feel good about my career plans	10	28 15.8	60 33.9	42 23.7	34 19.2	13 7.3	2.684 1.168
Using GIS helped me discover some of the important questions I should be asking during the process of choosing an occupation	6	39 21.5	95 52.5	34 18.8	13 7.2	0 0.0	2.116 0.825
EDUCATIONAL DECISION MAKING							
Using GIS helped me make educational plans	11	26 14.8	74 42.0	51 29.0	20 11.4	5 2.8	2.455 0.973
GIS helped me select a specific school or program for education or training	9	30 16.9	61 34.3	51 28.7	35 19.7	1 0.6	2.528 1.009
SELF AWARENESS							
I learned a lot about myself using GIS	8	21 11.7	50 27.9	67 37.4	29 16.2	12 6.7	2.782 1.138

TABLE 16 CONTINUED

CATEGORY AND ITEM	MISSING	STRONGLY AGREE	AGREE	UNSURE	DISAGREE	STRONGLY DISAGREE	MEAN/ STANDARD DEVIATION
SELF AWARENESS							
Using GIS helped me learn more about my values as related to career planning	7	27 15.0	84 46.7	51 28.3	14 7.8	4 2.2	2.356 0.907
Using GIS helped me learn more about interests as they relate to career planning	10	29 16.4	101 57.1	30 16.9	12 6.8	5 2.8	2.226 0.901
Using GIS helped me learn about my abilities as they relate to career planning	8	31 17.3	90 50.3	43 24.0	13 7.3	2 1.1	2.246 0.865

Note: On the Likert scale, Strongly Agree = 1, Strongly Disagree = 5 were not satisfied with the type of information GIS provided. Twenty-one (12 percent) were not sure. Forty-four (24 percent) strongly agreed that they got the type of information needed and 99, or 55 percent, agreed.

PUBLIC SCHOOL USERS--CAREER DECISION MAKING

There were six Likert scale items on the Public School Post Questionnaire relating to career decision making. Eighty percent (49 percent strongly agree and 31 percent agree) indicated that the computer was a great way to get information to help with choosing occupations. Only nine percent of the sample disagreed.

GIS was also a valuable tool for them to learn about occupations. Twenty-five percent strongly agreed, forty-five percent agreed, while only ten percent disagreed and six percent strongly disagreed.

Sixty percent felt that GIS helped them in learning how to make career decisions. Twenty percent indicated that they did not learn anything new about career decision making by using GIS.

About three quarters of the students felt that using GIS helped them discover some of the important questions they should be asking during the process of choosing an occupation. Nineteen percent were unsure, seven percent disagreed, and no one strongly disagreed.

GIS had some impact on stimulating students to use books and other materials in the guidance library that they would have otherwise ignored. Forty-six percent indicated that they did this; twenty-two percent were unsure, and 32 percent did not use such materials.

Eighty-five (50 percent) of the participants checked "yes" that GIS helped them to make a career or job decision. Almost all of these individuals added comments. The themes and examples of each are included in Table 17. Six themes were identified:

- GIS helped students make specific decisions;
- GIS provided useful career information;
- GIS helped students narrow their job or occupational choices;
- GIS opened or expanded their career horizons;
- GIS helped confirm career plans already made;
- GIS aided in career decision making.

The majority of comments were in the "Provided Information" and "Aided Decision Making" categories since most students were still formulating their career plans.

PUBLIC SCHOOL USERS'--EDUCATIONAL DECISION MAKING

About 57 percent of the students responding to the two educational decision making items reported that GIS helped them in making educational plans. Fourteen percent disagreed and 29 percent were unsure. A slightly lower percentage (51 percent) claimed that GIS helped them select a specific school for further education or training, but 29 percent were unsure. Twenty percent disagreed.

Eighty-eight (52 percent) of the group checked "yes" that GIS helped them to make a decision about further education. Almost all of the students included comments. The themes and examples of the comments are

TABLE 17

WAYS GIS HELPED PUBLIC SCHOOLS USERS MAKE CAREER OR JOB DECISIONS

THEME	EXAMPLES
Specific Action	Decided which college to go to Electronics
Confirmation of Plans	I had already decided on my career. GIS gave me all the information I needed on this career. Because it assured me that the career I had chosen was the right one for me.
Provided Information	It gave me information on what the job will be like. How much a year's salary will be and if that's a good trade for the area I'm in. Because it got me the information I needed. It gave me the information and it's what I want. It gave me names of colleges in other states that I didn't know existed. It told me some stuff I couldn't find out elsewhere.
Helped Narrow Choice	I wasn't quite sure which field of photography I wanted to go into. This narrowed the field down. It's helped me to narrow down my objectives but I still haven't totally decided. It has helped me to limit my possibilities.
Opened Opportunities, Expanded Horizons	It showed me what kinds of jobs that I wanted to look into but didn't know how to. Taught me what other occupations were all about before stepping into them. I now have a clearer idea of a job field.

TABLE 17 CONTINUED

THEME	EXAMPLES
Opened Opportunities Expanded Horizons(Continued)	It made me aware of the opportunities available.
Aided Decision Making	It helped me decide on what I might do. It's shown me what my commitments will be for the profession I was interested in and made me realize that it was the job I wanted. It has shown me my options. Because I was confused and it showed me what I would be good at. I may not be talented or skilled for this occupation so I am thinking. By explaining what courses and abilities are necessary for a certain profession. By giving me information that I found useful to pick my courses that I need for the occupation. It has shown me some of the things I can and can't do. GIS helped because it showed me things about careers that I did not like and changed my mind about pursuing that particular career.

included in Table 18. The themes identified were:

- GIS helped students take immediate specific actions;
- GIS helped students narrow their educational or training choices;
- GIS provided educational information which was helpful to the students;
- GIS stimulated thinking about their future education;
- GIS had an impact on their immediate educational decision making.

PUBLIC SCHOOL USERS'--SELF AWARENESS

There were five Likert items on the Post Questionnaire related to the impact of GIS on self-awareness. Forty percent (12 percent strongly agree; 28 percent agree) reported that they learned a lot about themselves as a result of using GIS. Twenty-three percent disagreed, while 37 percent were unsure.

A larger percent agreed that GIS helped them to learn more about their values as they relate to career planning. Fifteen percent strongly agreed, 47 percent agreed, 28 percent were unsure, and 10 percent disagreed.

A somewhat similar response pattern was noted in relation to career interests. Sixteen percent checked "strongly agree," and 57 percent agreed that they clarified interests by using GIS. Only about 10 percent disagreed.

Also, about 68 percent of the respondents indicated that GIS helped them learn more about their academic and social abilities as they relate to career planning. Only eight percent disagreed while 24 percent were unsure. There is a more positive response concerning the impact of GIS on specific dimensions of self, such as values, interests and abilities, than on the more general statement "I learned a lot about myself." Students had a hard time identifying the meaning of this last item. Between one-quarter and three-eighths of the students were unsure. It is not the purpose of GIS to develop

TABLE 18

WAYS GIS HELPED PUBLIC SCHOOL USERS MAKE EDUCATIONAL AND TRAINING DECISIONS

THEME	EXAMPLES
Specific Actions	To get my license to drive. In school, math, physics and algebra. It helped me find a college.
Helped Narrow Choice	Before I didn't know at all where to go for college but now I have a better idea. I either need 2 years of college or I can go to a trade school. It helped me locate the type of college I wanted to go to that I would like. Yes, I wasn't sure which college to look into and GIS narrowed it down to a few that I can check into. Yes, the GIS showed me that I really did not know what I wanted so I have to decide to take a liberal arts program to help me decide which way to turn. It has helped me narrow it down.
Provided Information	It tells you where schools are and things about them and most occupations you have to go on to school for. I have found information where I can go. They described the types of schools and they were very interesting. Where you can get that training and for how long. It gave me more information about more choices. It gave me a list of all the two year colleges that I would be interested in.
Stimulated Thinking	It has given me most specific areas to learn about. It has helped me understand

THEME	EXAMPLES
Stimulated Thinking, Cont.	what I had to do to get ahead. It has made me think more about going to vocational or trade school. It gave me more information about more choices. Got me interested in getting a higher degree than a bachelor's.
Effected Immediate Decision Making	It has made me decide to go on with schooling. To go to vocational school because of the qualifications it listed. I thought that I wouldn't qualify but found out differently. It told me what I had to have for my education after H.S. I found out how long I had to go to school.

greater self-awareness, but students are asked to make decisions based on their interests, values and abilities when they make a generalized search of the occupational file.

Fifty of the 187 students (30 percent) circled "yes" to the question, "Has using GIS helped you understand more about yourself?" Almost all checking "yes" included personal comments. Examples of the comments and themes identified are included in Table 19. Two themes were identified:

- GIS clarified their understanding of themselves; and
- GIS helped expand their personal self-understanding.

PUBLIC SCHOOL USERS'--JOB SEEKING SKILLS

Fifty-three (31 percent) of the 187 students indicated that GIS helped them to understand more about how to get a job. The themes and examples are summarized in Table 20. The same two themes were identified for public school users as for agency users:

- GIS provided relevant knowledge, and
- GIS helped students to identify job seeking strategies.

PUBLIC SCHOOL USERS'--JOB KEEPING SKILLS

GIS had the least impact on job keeping skills. Only 15 of the 187, or nine percent,said that GIS helped them to understand more about how to keep a job. Examples of some of the comments are:

- "If you're a more qualified person, you're liable to get the job. With that in mind, you'll get a job longer with the help of the computer."
- "By getting information about the rules that you follow in that occupation."
- "You plan for the atmosphere and your work had to fit it and keep the job."
- "By taking CO-OP."
- "You have to do your job right."

TABLE 19

WAYS GIS HELPED PUBLIC SCHOOL USERS UNDERSTAND MORE ABOUT THEMSELVES

THEME	EXAMPLES OF COMMENTS
Clarified Their Understanding	What I think I'm capable of. What I like and don't like. What is required. Things I'm good at. What it takes and what I've got.
Expanded Understanding	Putting all my qualifications together and getting answers out of the computer helped a lot. It's helped me realize that I am stubborn enough to overcome any obstacles that fall in my path and attempt to prevent me from earning my goal in life. It's made me realize what I can do It made me think. Gave me ideas on what to do. I can be who I want to be but I can't exaggerate my intelligence.

TABLE 20

WAYS GIS HELPED PUBLIC SCHOOL USERS UNDERSTAND MORE ABOUT HOW TO GET A JOB

THEME	EXAMPLES
Provided Relevant Knowledge	Where to go. It tells what kind of education to have. Well, it shows you what kind of education you need and skills to get the job. Schooling I need. Yes, I know where to look for information. It shows me the necessary requirements for a job. What schools, what subjects to take.
Helped Identify Job-Seeking Strategies	I can write to certain areas and get more information about how the job is running. How to choose the right job. It made me understand some of the ways you have to do things. To go and talk to them. You have to have special qualifications to get your job and you really have to work in your job. Because you have to tell what you have for skill and you have a chance of getting it. GIS has made me more aware on how qualifications are necessary for a job. With GIS I learned about certain things that would make me more qualified than if I hadn't used GIS before.

PEOPLE INVOLVED IN PLANNING

As a result of using GIS, students were asked how often they discussed their post high school plans with a selected list of individuals. The frequency of these discussions is reported in Table 21. Friends their own age were utilized most in these discussions. One hundred five respondents (59 percent) checked that they talked with friends their own age often. Parents were second (54 percent) and people in an occupation in which they were interested were third (36 percent). Clergy, principals and state employment service officers were least utilized by students discussing their post high school plans. These findings are consistent with other national and regional studies that report students select their parents and friends as first choices in discussing career plans. Professional agencies and counseling services are often viewed as places to go when one has a problem. For many youth, the process of career decision making is not viewed as a "problem" for when in doubt one can always respond "I'm going to college."

EDUCATIONAL ASPIRATIONS

The educational aspirations of the public school users are listed on Table 22. The information is included to describe and to help the reader understand the educational aspirations of the sample. The data cannot be used as a measure of the impact of GIS on educational planning. The students were asked to check the schooling they thought they would get and then to check the education they would like to have. Frequencies are presented to each question in Table 22. The crosstab of items by educational levels is not presented or analyzed. About three percent checked "quit school"

TABLE 21

PEOPLE UTILIZED BY STUDENTS TO DISCUSS PLANS AS A RESULT OF USING GIS

	PEOPLE	NEVER	SELDOM	OFTEN	MISSING
1)	Parents	18 9.8	66 36.1	98 53.6	5
2)	Relative other than parents	58 31.9	79 43.4	45 24.7	5
3)	Guidance counselor	43 23.6	83 45.6	56 30.8	5
4)	Teacher	84 45.9	60 32.8	38 20.8	5
5)	Principal	151 82.5	24 13.1	8 4.4	4
6)	Clergy	158 86.3	19 10.4	6 3.3	4
7)	State Employment service officer	143 78.6	28 15.4	11 6.0	5
8)	An adult not mentioned above	51 28.0	76 41.8	55 30.2	5
9)	Friends your own age	19 10.7	53 29.9	105 59.3	10
10)	People in occupation in which I am interested	47 26.6	62 35.0	64 36.2	14

on both items. The education students would like to have indicates that they perceive a need for post college work. The biggest difference between expected and desired levels of education is in the graduate school category. There is a slight drop between numbers expecting and desiring to graduate from high school and vocational-technical schools, and more of a drop in the junior college category. In general the students would like to have a higher level of education than they realistically expect to get. The data reflect the importance of educational decision making and planning as components of any sequential career education program.

TABLE 22

EDUCATIONAL ASPIRATIONS OF THE PUBLIC SCHOOL RESPONDENTS

SCHOOLING WILL ACTUALLY RECEIVE	f	percent	SCHOOLING WOULD LIKE TO HAVE f	percent
Quit School	7	3.8	6	3.4
Grad. H.S.	40	22.0	34	19.0
Voc.Tech.	40	22.0	35	19.6
Jr. College	28	15.4	17	9.5
4 Yr. College	52	28.6	39	21.8
Grad. School	15	8.2	48	26.8
Missing	5	-	8	-

Note: Responses indicate that these students perceive a need for advanced education but have probably compromised their aspirations due to financial limitations, etc.

TYPE OF COMMUNITY

The public school sample was divided into four categories: rural (Hodgdon, Houlton), urban (Lewiston, Auburn), small city (Old Town, Brewer) and institutionalized (Maine Youth Center). Chi-square analysis was computed on all the items by type of community. The analysis tested whether response to each item is independent of the type of community represented. There were significant differences found on sixteen of the 46 items (See Appendix K). Complete crosstabs on each item are not presented but the major discrepancies in the response patterns are reported.

Students from the small cities rated the occupation file more positively than rural students. It should be noted that all groups were positive but differed in their intensity.

There were several differences on the post questionnaire items. The institutionalized high school students had the greatest preference (27 percent) for human rather than computer help. Small city (16 percent) were next,followed by rural (13 percent). The lowest was the urban group (5 percent).

Small city students felt that GIS provided the type of information they needed. The urban and institutional respondents were least positive. The small city and rural groups reported "the information was easy to understand." The urban and institutional group had less positive feelings toward this. The small city and institutional students perceived that they learned more about occupations by using GIS than the urban group. More of the small city sample wanted and expected to get some form of post secondary education and rated the four-year college file more positively than the other groups.

As a result of the GIS experience students in small cities talked more with their parents than did institutionalized and rural pupils. Among the institutionalized group the principal and state employment officer were significant figures with whom they discussed their career plans.

More of the small city group discussed career planning with their peers. The urban and institutional students reported this less often, and the institutional group had little peer interaction. The small city group also communicated with guidance counselors more than the rural and urban groups. Further, the small city group wanted and expected to get some form of post-secondary education and rated the COL 4 file more positively than did the other groups.

In general, the small city group, perhaps because of nearness to the University of Maine and previous exposure to computers in school, tend to be more positive about their exposure to GIS. Also the social and economic makeup of the urban, rural and small city groups probably differs significantly. The institutionalized group is located in a completely different setting and has unique characteristics in relation to career needs.

AGE DIFFERENCES

Age did not seem to be an important variable in the interpretation of the impact of GIS. There were only six significant chi-squares and the differences in general were more random than systematic. Fifteen-year-olds talked with their parents least; 14-year-olds with relatives least. Both these age groups talked with counselors less than the older groups. Fifteen-year-olds were less positive about the value of using the computer. These trends might possibly be the result of adolescent role change, from dependence to independence.

SEX DIFFERENCES

There were only five significant chi-squares when the items were analyzed by the sex of the respondent. Girls tended to have higher educational aspirations than boys. Girls tended not to use the computer as many times as the boys. There were differences in frequency of use but not in the means of the two groups. Males rated the Armed Services Occupational file more positively than girls. More females than males felt GIS had helped them in making career decisions. Sex was not an important variable in evaluating the impact of GIS.

DIFFERENCES BETWEEN SCHOOL CLASSES

There were nine significant chi-squares when the items were broken down by class in school. In general the differences were more random than systematic. Only the major discrepancies are reported. Complete crosstabs for each item are not reported since cell size is small and generalizations tenuous. Freshmen felt that they learned more about occupations through GIS than the other classes. More Juniors and Seniors than Sophomores and Freshmen felt that GIS was a waste of time. It should be remembered that only 48 students felt GIS was a waste of time and within this group upper class students were more negative than lower class students. Seniors and Juniors talked with guidance counselors more than Freshmen and Sophomores. Sophomores talked with their relatives less than the other classes. Seniors had the highest level of educational aspirations; Freshmen, the lowest. Freshmen perceived GIS as more helpful in developing job-seeking skills than the other classes while Sophomores saw GIS more helpful in job-keeping skills than the other classes.

PROGRAM DIFFERENCES

There were ten significant chi-squares when the item responses were compared by type of high school program (college prep, general, vocational, business). College prep students tended to use the computer terminal more than the other groups and had the highest level of educational aspirations. More vocational students than college prep students felt that GIS helped them to make career decisions. This was also true of job-keeping skills. The general, vocational, and business students felt GIS was more helpful in developing job seeking skills than the college prep group. The vocational students found the MEVT file more helpful than the other groups. The general and vocational students were less likely to read books and pamphlets as a result of GIS than the other groups.

PUBLIC SCHOOL USERS'--CAREER EDUCATION ACTIVITIES

The respondents indicated participation in a wide range of career education activities (see Table 23). The theme most frequently heard by students in the career education program was "that a person can choose any job and that a person's sex or race should not matter in making a job choice." The activity second most frequently reported was talking about jobs with groups of students. The third most frequent activity was for students to discuss their own values in relation to work. The fourth was to study the interests and abilities people need for particular jobs and careers. The fifth activity was to ask parents questions about what they do at work. Students had the least exposure to field

TABLE 23

CAREER EDUCATION ACTIVITIES OF HIGH SCHOOL SAMPLE

ACTIVITY	ALMOST EVERY DAY	ONCE A WEEK	ONCE/ TWICE A MONTH	LESS THAN ONCE PER MONTH	NEVER	MISSING
1) Use TV, tapes, filmstrips or radio to learn about jobs	9 7.3	10 8.1	17 13.8	31 25.2	56 45.5	---
2) Attend a career fair	1 0.8	1 0.8	4 3.3	47 38.2	68 55.3	2 1.6
3) Talk about jobs and careers with groups of students	16 13.0	30 24.4	30 24.4	24 19.5	22 17.9	1 0.8
4) Go around with workers to learn what they do on their jobs	6 4.9	5 4.1	10 8.1	41 33.3	57 46.3	4 3.2
5) Talk about how people in certain jobs and careers may have certain attitudes and values	15 12.2	10 8.1	20 16.3	43 35.0	34 27.6	1 0.8
6) Study the interests and abilities people need to have for particular jobs and careers	19 15.4	14 11.4	33 26.8	34 27.6	23 18.7	---
7) Talk with the class about what was learned about careers on field trips	0 0.0	2 1.6	8 6.5	27 22.0	81 65.9	5 4.1
8) Use the library or learning center to learn of careers	6 4.9	13 10.6	34 27.6	34 27.6	36 29.3	---

TABLE 23 CONTINUED

	ACTIVITY	ALMOST EVERY DAY	ONCE A WEEK	ONCE/ TWICE A MONTH	LESS THAN ONCE PER MONTH	NEVER	MISSING
9)	Go on field trips to businesses or industries to learn what people do in their jobs	3 2.4	1 0.8	12 9.8	36 29.3	67 54.5	4 3.3
10)	Listen to workers talk to the class about the work they do	6 4.9	7 5.7	18 14.6	38 30.9	53 43.1	1 0.8
11)	Listen to the parents of other students in the class talk to the class about what they do in their work	6 4.9	5 4.1	7 5.7	22 17.9	82 66.7	1 0.8
12)	Take tests to find out how much I know about different jobs and what people in them do	2 1.6	3 2.4	11 8.9	33 26.8	71 57.7	3 2.4
13)	Take home material from class so that my parents can help me learn about jobs and what work I might want	3 2.4	11 8.9	16 13.0	33 26.8	58 47.2	2 1.6
14)	Ask my parents questions about what they do at work	13 10.6	26 21.1	24 19.5	31 25.2	21 17.1	8 6.5
15)	Hear that a person can choose any job and that a person's sex or race should not matter in making a job choice	30 24.4	21 17.1	31 25.2	23 18.7	16 13.0	2 1.6

TABLE 23 CONTINUED

ACTIVITY	ALMOST EVERY DAY	ONCE A WEEK	ONCE/ TWICE A MONTH	LESS THAN ONCE PER MONTH	NEVER	MISSING
16) Talk about my own values about work	12 9.8	23 18.7	30 24.4	32 26.0	17 13.8	9 7.3
17) Hear about how to look for and get a job	14 11.4	16 13.0	28 22.8	42 34.1	21 17.1	2 1.6
18) Get personal advice from people in the school about my future job possibilities	9 7.3	18 14.6	37 30.1	31 25.2	27 22.0	1 0.8
19) Get personal advice from people at school about future educational possibilities and how to apply to college	8 6.5	11 8.9	34 27.6	37 30.1	29 23.6	4 3.3
20) Take tests to find out about my job interests and skills	2 1.6	6 4.9	17 13.8	51 41.5	44 35.8	3 2.4
21) Get personal help from people in school in finding a paid job	11 8.9	4 3.3	10 8.1	25 20.3	70 56.9	3 2.4
22) Take part in a school-supervised work experience or work study program	17 13.8	5 4.1	5 4.1	6 4.9	85 69.1	5 4.1

NOTE: Individual item responses and computed percentages for 125 respondents are presented in this table.

trips as a form of career exploration, having parents of students talk to the class about what they do in their work, career fairs and in taking tests to find out how much they know about jobs.

These findings lend further support to the need for comprehensive career education programs in Maine schools. Quite frankly, career planning and decision making is being left to chance. If the student is lucky and has a counselor or teacher with serious interest in career guidance, he or she is apt to participate in isolated activities. Participation in several chance activities over four years of high school is difficult to accept, particularly when these high school students will be entering a complex technological world in the 1980's.

AGENCY-SCHOOL COMPARISONS

Both groups found the purpose of GIS clear to them (100 percent, agency; 98 percent, schools. Neither group had much trouble with using the GIS Guide and Summary Sheet. Eighty-eight percent of the agency group found the directions clear, compared to 89 percent of the public school users.

There were three common questions (Items 3, 4, and 5) on the Users Log to evaluate the system (See Appendix C). Eighty-eight percent of the agency users said they enjoyed using GIS compared to 74 percent of the public school users. Forty-seven percent of the agency users said they got the information they needed from GIS, compared to 54 percent of the public school users. About 25 percent of each group reported that GIS had helped them in their educational and/or vocational choices. Sixty percent of the agency users and 63 percent of the students stated that GIS was useful.

Both groups used the OCCU file most frequently (85 percent, agency; 87 percent, schools). The students utilized the COL 2 and COL 4 files more than agency users (8 and 3 percent). The agency group called up MEOC more than the public school group (35 as compared to 13 percent). There were no major differences on the use of GRAD, MEVT or AIDS.

The public school users tended to use the terminal more than agency users. The mode for each group was one,but the mean for public school users was 2.76 as compared to 1.90 for agency users.

A comparison of the two groups is presented in Table 24. It should be noted that a three point scale was used on the Agency Post Questionnaire while a five point scale was used on the Public School Users Post Questionnaire. For purposes of comparison the public school user scale was collapsed to a three point scale.

Overall there were no major differences in how the two groups evaluated their GIS experience. Ninety-one percent of both groups found it fun to use the computer terminal. Around eighty percent of both groups found using GIS a pleasant personal experience. More of the agency group (89 percent) than public school group (79 percent) found GIS easy to understand. More of the public school group (79 percent) than the agency group (69 percent reported that GIS gave them the type of information they wanted. Possibly the agency group was more mature and seeking specific information while the public school users were less mature and still exploring career areas.

Slightly over three-quarters of both groups indicated that GIS helped them enough that they thought all people should have exposure to the system.

TABLE 24

COMPARISON OF AGENCY AND PUBLIC SCHOOL USERS ON COMMON ITEMS ON POST QUESTIONNAIRE

CATEGORY AND ITEM	AGENCY PERCENT	PUBLIC SCHOOL PERCENT
EVALUATION		
Fun to use computer terminal	90.9	90.7
GIS, pleasant personal experience	80.2	78.5
GIS, cold, impersonal experience	2.3	13.0
Easy to understand	88.8	79.4
Type of information wanted	68.5	79.4
People should have human help	3.3	13.2
All people should have opportunity	77.5	77.9
GIS was a waste of time	4.4	26.5
CAREER DECISION MAKING		
Read books or pamphlets	42.2	46.3
GIS helped a career decision	51.0	50.0
Feel good about career plans	51.2	49.7
Learned a lot about occupations	80.2	69.8
Great way to help choosing occupations	87.8	80
Did not learn how to make career decisions	11.2	26.8

TABLE 24 CONTINUED

CATEGORY AND ITEM	AGENCY PERCENT	PUBLIC SCHOOL PERCENT
EDUCATIONAL DECISION MAKING		
Helped me make educational plans	36.8	56.8
Helped me select specific school	26.1	51.2
GIS helped educational decision	47.0	52.0
SELF AWARENESS		
GIS helped in self awareness	46.5	30.0
Learned more about my interests	71.6	73.5
Learned about my abilities	56.8	57.6
Learned a lot about myself using GIS	33.7	39.6
Learned more about my values	61.8	61.7
GIS helped job seeking skills	46.0	31.0
GIS helped job keeping skills	22.0	9.0

The public school users were slightly more negative about their GIS experience than the agency users. Thirteen percent of the public school Users found GIS to be a cold impersonal experience as compared to two percent of the agency users. The same pattern held true for their attitudes that people should always have help from a human, never a computer. About a quarter of the students indicated that the GIS was a waste of time as compared to only four percent of the agency clients.

There were differences in the intensity of users' feelings that GIS had helped them in making a career or job decision. About half of both groups indicated that it had. Eighty-eight percent of the agency users as compared to 80 percent of the public school users felt that GIS was a great way to get information to help with choosing occupations. About half of both groups reported that GIS helped them feel good about their career plans. Slightly more students read books and pamphlets about jobs and training after using GIS than agency clients (46 to 42 percent). About 11 percent of the agency sample and 21 percent of the public school sample indicated that they did not learn anything new about how to make career decisions by using GIS.

More of the public school users indicated that GIS had an impact on their educational or training decisions than agency users. Fifty-seven percent of the Public School users as compared to 37 percent of the agency users stated that GIS helped them to make the educational plans they needed to make. Fifty-one percent of the students as compared to 26 percent of the agency clients indicated that GIS helped them select a specific school or program for further education or training. Overall 47 percent of the agency sample and 52 percent of the public school sample reported that using GIS helped them make a decision about further education or training.

Overall, the groups had similar perceptions of the value of GIS in developing self awareness. Slightly over 70 percent of both groups indicated that GIS helped them learn more about their interests, slightly over 60 percent indicated that GIS helped them learn more about their values and 57 percent their abilities. Slightly above one-third of each group stated that they learned a lot about themselves using GIS. When asked whether GIS helped them understand more about themselves, 46 percent of agency users checked "yes" as compared to 31 percent of the public school users.

More of the agency users than public school users felt that GIS had helped them in job-seeking skills (46 to 31 percent). A lesser proportion perceived that GIS helped them in developing job-keeping skills, twenty-two percent of the agency users to 9 percent of the public school users.

PHASE 1 - PHASE 2 COMPARISONS

There were a number of common items on the questionnaire used in Phase 1 and Phase 2 of the GIS Impact Study. The item format and response format changed between the two phases,but comparisons are possible for both immediate reaction to GIS as measured by the User's Log and the delayed reaction as measured by the User Post Questionnaires.

The OCCU (Occupational Information file) was the primary file and was used by over 80 percent of the users in both phases. The COL 4 (four-year college) file was second most frequently used in both phases of the study. In both phases, clients found the purpose clear. Ninety-three percent of the users in phase one concurred as compared with 100 percent of the agency users and 98 percent of the public school users in Phase 2.

The directions for using the GIS Guide and Summary Sheet were clear to the majority of users (88 percent of Phase 1 users, 88 percent of agency users in Phase 2, 89 percent of public school users in Phase 2).

It was a pleasant experience, overall, for all participants. Seventy-one percent in Phase 1 reported they enjoyed the experience. Eighty-eight percent of the agency users and 74 percent of the public school users in Phase 2 felt this way.

More individuals in Phase 2 reported they got the information they needed than in Phase 1 (schools Phase 2, 54 percent; agency Phase 2, 47 percent; Phase 1, 38 percent).

More individuals in Phase 2 reported that GIS helped them in career or educational decisions than in Phase 1 (25 percent in Phase 2 and 10 percent in Phase 1). About the same percentage in both phases stated it was useful (Phase 1, 63 percent; agency Phase 2, 60 percent; schools Phase 2, 63 percent).

A comparison of the common items across the two testing periods is given in Table 25. The overall evaluation of GIS by both groups was more positive in the second phase (Sept.-Dec., 1979) than the first phase (Feb.-June, 1979). The only exception was that more public school users reported that GIS was a cold impersonal experience in the second period than the first (13 percent to one percent). The public school users found it more fun to use (71 percent to 91 percent). The agency users increased from 58 percent to 91 percent in rating GIS fun to use. The proportion of users reporting GIS to be a pleasant personal experience doubled (schools, 34 percent to 79 percent) (agency, 37 percent to 80 percent).

There were increases in the rating of the information provided. While 63 percent felt the information was excellent the first time, 78 percent agreed the second time. The number of people understanding the information increased (Phase 1, 63 percent; Phase 2, 79 percent).

TABLE 25

COMPARISON OF PHASE ONE AND TWO RESPONSES ON THE POST QUESTIONNAIRES

DIMENSION/ITEM	PUBLIC SCHOOL PHASE I	PUBLIC SCHOOL PHASE II	AGENCY PHASE I	AGENCY PHASE II
EVALUATION	%	%	%	%
FUN TO USE	71	90	58	90
COLD IMPERSONAL EXPERIENCE	1	13	0	2
PLEASANT PERSONAL EXPERIENCE	34	79	37	80
NO TROUBLE UNDERSTANDING	51	79	--	--
INFORMATION EXCELLENT	63	79	--	--
ALL SHOULD HAVE EXPERIENCE	43	77	63	77
SELF-AWARENESS				
LEARNED A LOT ABOUT MYSELF	21	46	42	39
LEARNED ABOUT MY INTERESTS	44	73	37	71
LEARNED ABOUT MY ABILITIES	33	57	32	56
LEARNED ABOUT MY VALUES	23	61	32	61
CAREER DECISION MAKING				
GREAT WAY TO GET HELP	80	80	63	87
LEARNED A LOT ABOUT JOBS	75	69	69	80
DIDN'T LEARN ANYTHING NEW	8	20	5	11
DID READING ABOUT JOBS	29	46	37	42
TALKED WITH PEOPLE IN JOBS	49	36	--	--
EDUCATIONAL DECISION MAKING				
HELPED IN EDUCATIONAL PLANS	41	56	--	--

A greater number of individuals, both agency and public school users, felt that all individuals should have exposure similar to theirs with GIS (schools, 43 percent to 78 percent; agency, 63 percent to 78 percent).

Users report a greater impact on self-awareness in the second test period. In most cases about twice as many students felt that GIS had helped them understand themselves, their interests, abilities and values. The same trend was true for the agency group except for "learning a lot about myself". Slightly less checked "yes" in the second phase than the first (Phase 1, 42 percent; Phase 2, 40 percent).

There was not as dramatic a shift occurring in career decision making for the public school group as for the agency sample. Overall agency clients felt more positive in the second phase about the help received from GIS, for example, learning about jobs, reading books and pamphlets about jobs.

A greater percentage, although low, of both groups reported that they didn't learn anything new about decision making as a result of using GIS (schools: Phase 1, 8 percent; Phase 2, 21 percent: agency: Phase 1, 5 percent; Phase 2, 11 percent).

Eighty percent of the public school users on both trials felt that GIS provided a great way to get help in career choice. Slightly fewer said they learned a lot about occupations the second time (75 percent to 70 percent). More were stimulated to do reading in books and pamphlets about jobs in the second trial than in the first (29 percent to 46 percent). Fewer people talked with individuals in jobs the second trial period than in the first (49 percent to 36 percent).

Also, the students reported that GIS helped them more with their educational plans during the second stage of the project than in the first.

IMPACT OF GIS ON SITES

At most sites the use of GIS has stimulated training programs for staff, interested teachers and counselors so that they know how to use the system. At most of the public school sites students have been also trained to help their peers with questions they might have on the operation of GIS. At one high school, a business course has been modified so that students will be able to utilize GIS. At some other schools, teachers work GIS into units of study. At some sites counselors use regularly scheduled classes to go over how to fill out the GIS summary sheet. The use of small groups for career counseling has been tried at one site. More individual career counseling sessions have been initiated at another (See Appendix J).

There have been some increases in staff at some sites where CETA funds have been available. These individuals have been assigned the responsibilities of scheduling GIS, teaching career education classes and training clients to use GIS. At most sites, one person is assigned the responsibility of managing GIS although all the other counselors are usually trained in GIS. This individual is responsible for scheduling GIS and for training faculty and students for peer roles (See Appendix J).

GENERAL EFFECTS OF GIS

Participation in the MOICC project has generated a number of site changes. Certain sites have found it necessary to increase their career education library. They have found GIS to be motivational. Students enjoy using the computer, and many have overcome their anxiety about using the computer. Even special education students have used GIS and the terminal successfully. Students seem to be more willing to be involved with GIS because they do not have to spend as much time hunting for career information. Some sites report that the GIS experience has helped develop more responsibility on the part of students because they have become actively involved in the process.

GIS has changed the roles of counselors. For example, some have different time allocations and priorities. Others spend more time in individual and group counseling and less time in information giving. In general, they feel it has helped them make more efficient use of their time (See Appendix J).

One counselor reports that GIS has helped change the image of the counseling office. It is not just thought of as a place where individuals go when they are in trouble.

To reiterate, counselors feel that it was a motivational experience for students, who have a tangible product--a printout of their search. The clients at the Maine Correctional Center at South Windham wallpapered their cells with the printout.

PROBLEM AREAS

All sites reported that they would like to continue using GIS but are afraid there will be no funds in their 1980-81 budget for the service. Cost is one of the major problems in continuing this developmental effort.

Secondly, a number of sites were sharing terminals and this lead to limited availability in several situations. Terminal downtime occurred because the equipment was not truly portable and because transportation between sites was difficult.

Thirdly, the accuracy of files is seen as important. There was negative counselor feedback in relation to MEOC (The Maine Occupational File). The counselors felt that it needs more frequent updating and should include a broader representation of Maine occupations.

Fourth, personnel is a problem. At some sites there was a turnover of personnel and new staff were not familiar with GIS, expectations of the MOICC project and data collection requirements. In particular, we noted an unevenness among sites in collecting, tabulating and forwarding data to the Career Education Center at UMO. This resulted in data analysis delays and a smaller total sample than was possible if all sites had met their quotas.

Fifth, we suspect that several sites never really accepted the basic intent of MOICC and the attempt to field test a computer information system for use in Maine. Philosophically, counselors who lean to a humanistic or existential philosophy would have difficulty accepting the basic theory that supports computer information systems. Another problem tangential to this was the lack of basic computer literacy and awareness that exists among counseling personnel in agencies and schools. Intensive in-service training will be needed to overcome this lack of computer technology awareness.

SUMMARY

Overall, the results are positive and indicate that continued use of GIS is needed in both schools and agencies. The critical need will be for staff development and new directions in agency operational policy. Public schools will need accompanying career education programs to support GIS utilization.

Agency users reacted positively to the GIS according to the data analyzed. The users felt that career decision making, educational decision making, and selected elements of self awareness were enhanced by using GIS. To a certain degree job-keeping skills were developed according to the perceptions of these users. It must be noted that GIS does not purport to develop job-keeping or seeking skills.

Public school users were supportive of GIS as an aid in vocational and educational planning. In general, GIS was perceived as helpful and motivational in stimulating their career planning. Career decision making, educational planning, self-awareness and job-seeking skills were developed as a result of using GIS. The area of job-keeping skills was not significantly impacted according to results of this study. A small percentage of public school users indicated GIS was helpful in this area, but it was not of major impact.

Section 4 will present specific conclusions and recommendations for potential users of GIS.

SECTION 4

CONCLUSIONS AND RECOMMENDATIONS

The purpose of this study was to determine the impact of GIS on career decision making, educational decision making, self-awareness, job-seeking skills and job-keeping skills of agency and public school users. A secondary purpose of this study was to investigate the impact of GIS on the personnel and programs at the different sites. The users evaluated GIS after they first interacted with the system and then after a period of six to eight weeks; questionnaires were used for the evaluations. The site coordinators were interviewed by an independent group, Social Science Research Institute (SSRI), to secure additional information regarding the impact of GIS on program and personnel.

The following inferences can be drawn from the data presented:

1. Users understood the purpose of GIS and overall had no trouble using the GIS Guide or filling out the Summary Sheet.

2. Users enjoyed using the system and it was interesting to them. There was little anxiety concerning the use of the computer or terminal and in most cases the GIS experience was motivational.

3. The majority of users felt the information from GIS was good. There were few criticisms of the GIS content. The files which received the most criticism were ASOC (Armed Services Occupational File) and MEOC (Maine Occupational File).

4. The majority of users, agency and public school, used the OCCU (Occupations File). They found this information helpful and it

received the highest rating of all the files used.

5. The evaluation of GIS by both sets of users was very positive. They found GIS a pleasant, personal experience, easy to understand and fun. The majority of users indicated that GIS helped them and that all people should have the same opportunity they did.

6. About half of both groups felt that GIS had helped them in making a career or job decision.

7. GIS had greater impact on the educational decision making of public school users than agency users.

8. To some extend GIS helped people understand the role interests, values, and abilities play in career decision making. More agency people than high school students felt that GIS had aided them in self-understanding.

9. GIS had a lesser impact on job-seeking skills. More agency than public school users felt that GIS had helped tham in job-seeking skills.

10. GIS had the least impact on job-keeping skills. Twenty-two percent of the agency users and nine percent of the public school users indicated that GIS had helped in this area.

11. The sites were more organized and had developed better strategies and delivery systems for GIS in the second phase than in the first. There were more positive attitudes expressed by both groups on all major evaluation dimensions (evaluation of GIS, career decision making, educational decision making, job-seeking skills) in the second phase of the project than in the first phase.

12. All sites which participated in GIS during the fall of 1979 would like to continue the program, but not all felt that it would be picked up by the agency or school system.

13. GIS did have an impact at the sites on the role of the counselor and the type of career education program developed.

14. Sex, age, class and high school program were not important or significant variables in the interpretation of the impact of GIS on high school users.

15. Size of community was a variate which related to type of program and uses made of GIS. Students from small city schools tended to use the system more and rate certain dimensions higher.

16. Sex and age were not important variables in interpreting the agency results. There were differences between agencies on how GIS was evaluated and received. In general, the type of populations served differed in relation to goals and motivations of the users, as well as the type of counseling program at each site.

RECOMMENDATIONS

1. There is a need for sites to have an orientation system to help individuals who become confused by working with GIS. Small group and/or individual counseling sessions may be necessary. Peer groups trained to help students with using the GIS Guide and Summary Sheets may be one way to reduce anxiety about using the system.

2. The files, especially MEOC, (Maine Occupations File) need to be frequently updated and others need to be evaluated periodically.

3. Site coordinators and students from participating sites ought to be utilized in any training sessions held for new sites.

4. The impact that GIS has, depends to a large degree, upon the career guidance program at each site. The inclusion of test data from interest, aptitude and achievement testing might help students set more

realistic goals and sharpen their search requests. Periodic seminars and inservice sessions on career guidance are needed more than training on the operation of GIS and should be developed.

5. The study examined short term impact and there is a need for a longitudinal study of users over a longer time span.

6. GIS will not receive full utilization unless an intensive network of workshops is delivered to increase computer literacy and awareness among professionals in human service agencies.

7. Human service agencies and public schools must address the philosophical issues related to integrating computer information systems in daily activities and to reduce resistance.

8. The sites need to have developed a planned program of career education in which GIS is systematically utilized, not just included as a frill or an incidental exercise.

9. GIS has potential to be used by subject area teachers to illustrate the different types of career fields that relate to specialization in that subject area. The system could be used in economics and other social studies areas to study local job markets and job opportunities.

10. Parent and citizen involvement in local workshops illustrating the value of such a system might aid in securing local funding for the project.

11. Instrumentation for assessing GIS impacts on users must be carefully selected to assure that what is being assessed correlates with what counselors actually do.

12. Technical assistance to existing and new sites must be improved to assist inexperienced counselors in implementing GIS.

In summary GIS has had an impact on users and sites, more on career decision making than any other dimension. It has been well received. The evaluations have been positive across sites and users and appear to be consistent even though the sample was limited. Philosophical and operational differences between agency and school sites made it difficult to assess with accuracy all impacts that occurred. In essence, we can say with reasonable certainty that GIS works, but differential levels of use at each site prohibit wide scale generalizations. Counselors, teachers, and administrators in all sites will need to develop and implement comprehensive career education programs of which GIS becomes a part. There was a tendency for personnel to view GIS as a complete program, and once users had interfaced with the terminal it was assumed that career counseling was no longer needed. Quite the contrary, intensive career guidance services are needed prior to and after using GIS. The future development and use of GIS in Maine appears promising if career guidance programs are developed that use the computer as part of a total effort.

A comprehensive career education program will require:

- Continuous assessment of student or adult career plans,
- Valid occupational sampling and field experience by each participant,
- Established procedures for group and individual career counseling,
- Continuous evaluation of learner outcomes,
- Access to a variety of career information, and
- Development of decision-making skills.

The key element inherent in these comments is that of early planning, testing and revision. We strongly urge that the results of this study be used to help clarify the career education concept and to develop a comprehensive plan for Maine schools and human service agencies.

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APPENDIXES

Appendix A

The followint public schools and agencies participated in the field test of GIS.

Public Schools	Site Coordinator
Hodgdon High School	Harvey Harrington Terry Comeau
Houlton High School	Don Duplessis
Houlton Regional Voc. H.S.-S.A.V.E.	Robert Matthews
Old Town High School	Rick Davis
Brewer High School	Paul Paulson
Lewiston High School	Don Cannan Marguerite Murphy
Edward Little H.S.	Lynn Markee
Agencies	
Aroostook C.A.P. - (C.E.T.A.)	Greg Doughty
Penobscot Consortium (C.E.T.A.)	Geeta Balakrishnan
Maine Job Service	Cole Sargent
University of Maine at Augusta	Kathy Dexter
Maine Youth Center	Peter Brunette
Maine Correctional Center	Susan Millar

UNIVERSITY OF MAINE at Orono

Center For Career Education
College of Education

104 Shibles Hall
Orono, Maine 04473
207/581-2531

September 21, 1979

MOICC CAREER GUIDANCE IMPACT STUDY

Dear Colleague:

The Career Education Center, under contract to MOICC is conducting the Fall, 1979 impact analysis to assess user reactions to G.I.S. This evaluation effort has two major goals:

1. To assess impact on selected users in 13 different sites as a result of interacting with the G.I.S. over differential time periods.
2. To assess program impact on the 13 sites as a result of having selected agency clientele use G.I.S. and available counseling services.

It is important to stress that user data will be treated in the strictest confidence. The data will be used to prepare a report on G.I.S. impact upon users and counseling programs, but not to evaluate individual counselors, teachers, or administrative personnel. To insure accuracy in data collection we need your assistance and compliance with the following tasks:

1. Maintain an accurate record of users - please provide each new user a Users Log to complete after their first session on the terminal or in a group information session to discuss the printout. If they return for additional sessions do not have them fill out another log.
2. Administer the Post Questionnaire that is appropriate for your agency or school prior to November 30, 1979. It is anticipated that users will be posttested two to six weeks after exposure to G.I.S. We would like at least 30 data sets from your site. A data set includes: One Users Log or Batch Processing Form and one completed post questionnaire.

IMPORTANT: From the Users Log list select every third person and repeat the process until you have a sample group that equals 30 names. For example, if your total number of users is 60 it will be necessary to use the above process until 30 names are obtained. You should select sample members from both the user and batch processing categories. Administer the post questionnaire to these 30 people. Don't use names, always use a number for identifying people.

3. The code number for your site is ________ and should be used on all documents for identification purposes.

4. Users (students, clients or trainees) should use the last four digits of their social security number on all documents where appropriate. If users do not have a social security number it will be necessary to assign them a four digit number from a list developed by you. Please have users record the same number on both the Users Log and post questionnaire.

We appreciate your help in collecting the data and anticipate the results being of help in developing the career guidance aspects of the agency or school program. If you should have any questions, please call either Chuck Ryan at (207) 581-2466 or Bob Drummond at (207) 581-2792.

Cordially,

Chuck

Charles W. Ryan
Project Director

Bob

Robert Drummond
Research Associate

NOTE: We anticipate mailing of the test material will commence on Sept. 28, 1979.

CWR/lc

cc: Gerard Bilodeau
Steve Thompson

Appendix C
MOICC CAREER GUIDANCE IMPACT STUDY - PUBLIC SCHOOL USER'S LOG

SITE NAME OR NUMBER____________________ DATE______________

SOCIAL SECURITY
OR I.D. NUMBER__________________________ AGE_____ SEX______

CIRCLE GRADE: 7 8 9 10 11 12

PROGRAM:
___College Prep
___General
___Vocational
___Commercial/Business
___Other (specify)

FILE OR FILES USED (Check those appropriate)

___Occupational Information OCCU
___Armed Services Occupational Information ASOC
___4 Year College Information COL 4
___2 Year College Information COL 2
___Graduate School GRAD
___Financial Aid Information File AIDS
___Occupation File MEOC
___Maine Vocational Training File MEVT

1. Was the purpose for using GIS clear to you? ___YES ___NO

2. Were the directions for using the GIS Guide and filling out the Summary Sheet clear to you? ___YES ___NO

3. How interesting was using the GIS system?
___Enjoyed it
___Okay
___Disliked It

4. Did you get the type of information you needed from the system?
___All I needed
___Needed more
___Not sure

5. What was your general reaction to using the system?
___It helped me make vocational and educational choices
___It was useful - I learned helpful things
___I am not sure now
___It was a waste of time
___It was no help at all

6. As a result of using the GIS system, I am planning to: (Check all appropriate responses)
___Talk with my counselor
___Talk with my parents
___Talk with my teachers
___Talk with people in the occupations
___Write for school catalogs and information
___Get more books and material to read on the topic
___Other (specify)______________________________

PLEASE COMMENT:____

Prepared by Staff, Career Education Center, College of Education, UMO 10-1-79

MOICC CAREER GUIDANCE IMPACT STUDY AGENCY USER'S LOG

SITE NAME OR NUMBER________________________ DATE______________________
SOCIAL SECURITY
OR I.D. NUMBER________________________ AGE_____ SEX_____

CIRCLE HIGHEST GRADE IN SCHOOL COMPLETED: 7 8 9 10 11 12 13 14 15 16 17 18 19

FILE OR FILES USED (Check those appropriate)

____Occupational Information OCCU
____Armed Services Occupational Information ASOC
____4 Year College Information COL 4
____2 Year College Information COL 2
____Graduate School GRAD
____Financial Aid Information File AIDS
____Maine Occupation File MEOC
____Maine Vocational Training File MEVT

1. Was the purpose for using GIS clear to you? ____YES ____NO

2. Were the directions for using the GIS Guide and filling out the Summary Sheet clear to you? ____YES ____NO

3. How interesting was using the GIS system?
____Enjoyed it
____Okay
____Disliked it

4. Did you get the type of information you needed from the system?
____All I needed
____Needed more
____Not sure

5. What was your general reaction to using the system?
____It helped me make vocational and educational choices
____It was useful - I learned helpful things
____I am not sure now
____It was a waste of time
____It was no help at all

6. As a result of using the GIS system, I am planning to:
(Check all appropriate responses)
____Talk with my parents ____Talk with my teachers
____Talk with my counselor ____Talk with people in the occupations

____Write for school catalogs and information
____Get more books and material to read on the topic
____Other (specify)____

PLEASE COMMENT: ____

Prepared by Staff, Career Education Center, College of Education, UMO

10-1-79

Fall Testing MOICC Project

Appendix E

MOICC CAREER GUIDANCE IMPACT STUDY
PUBLIC SCHOOL USER'S POST QUESTIONNAIRE

SITE NAME ______________________________ DATE ____________________
SOCIAL SECURITY
OR I.D. NUMBER ______________________________ AGE _____ SEX _____

CLASS: ____1. Freshman ____2. Sophomore ____3. Junior ____4. Senior

PROGRAM:
____1. College Prep
____2. General
____3. Vocational
____4. Commerical/Business
____5. Other

WHAT FILE OR FILES DID YOU USE? (Check those appropriate)

____Occupational Information OCCU
____Maine Occupation File MEOC
____Armed Services Occupational Information ASOC
____4 Year College Information COL 4
____2 Year College Information COL 2
____Graduate School GRAD
____Financial Aid Information File AIDS
____Maine Vocational Training File MEVT

HOW MANY TIMES DID YOU USE THE COMPUTER TO CALL UP THE FILES? _____

Using the following 5 point scale, CIRCLE how you felt about the files used.

1. EH = EXTREMELY HELPFUL
2. VH = VERY HELPFUL
3. SH = SOMEWHAT HELPFUL
4. LH = OF LITTLE HELP
5. NH = OF NO HELP AT ALL

REMEMBER - RATE ONLY THE FILES YOU USED

Occupational Information OCCU	EH	VH	SH	LH	NH
Maine Occupational file MEOC	EH	VH	SH	LH	NH
Armed Services Occupational Information ASOC	EH	VH	SH	LH	NH
4 Year College Information COL 4	EH	VH	SH	LH	NH
2 Year College Information COL 2	EH	VH	SH	LH	NH
Graduate School GRAD	EH	VH	SH	LH	NH
Financial Aid Information File AIDS	EH	VH	SH	LH	NH
Maine Vocational Training File MEVT	EH	VH	SH	LH	NH

FALL TESTING MOICC PROJECT

Prepared by Staff, Career Education Center, College of Education, UMO

10-1-79

PUBLIC SCHOOL USER'S POST QUESTIONNAIRE continued

Read ITEMS 1 to 20 and decide how you feel about each using the following scale. CHECK your response to each item.

1. SA = STRONGLY AGREE
2. A = AGREE
3. ? = UNSURE
4. DA = DISAGREE
5. SDA = STRONGLY DISAGREE

		SA	A	?	DA	SDA
1.	It was fun to use the computer terminal.	___	___	___	___	___
2.	Using GIS was a pleasant personal experience.	___	___	___	___	___
3.	Using GIS was a very cold, impersonal experience.	___	___	___	___	___
4.	The computer is a great way to get information to help with choosing occupations.	___	___	___	___	___
5.	Students should always have help from a human, never a computer.	___	___	___	___	___
6.	I learned a lot about myself using GIS.	___	___	___	___	___
7.	GIS helped me feel good about my career plans.	___	___	___	___	___
8.	I did NOT learn anything new about how to make career decisions by using GIS.	___	___	___	___	___
9.	Using GIS helped me to make the educational plans I need to make.	___	___	___	___	___
10.	Using GIS helped me to learn more about my values as they relate to career planning.	___	___	___	___	___
11.	Using GIS helped me to learn a lot about occupations.	___	___	___	___	___
12.	Using GIS was a waste of time; it didn't help me at all.	___	___	___	___	___
13.	Using GIS helped me to learn more about my interests as they relate to career planning.	___	___	___	___	___
14.	Using GIS helped me to learn about my abilities as they relate to career planning.	___	___	___	___	___
15.	GIS helped me enough that I think all students should have the same opportunity I did.	___	___	___	___	___
16.	GIS helped me select a specific school or program for further education or training.	___	___	___	___	___
17.	Using GIS helped me discover some of the important questions I should be asking myself during the process of choosing an occupation.	___	___	___	___	___
18.	GIS provided me with the type of information I wanted.	___	___	___	___	___
19.	The information from GIS was easy to understand.	___	___	___	___	___
20.	After using GIS, I began using books and other materials in the guidance library that I otherwise would have ignored.	___	___	___	___	___

21. What is the highest level of schooling that YOU THINK YOU WILL GET? At a minimum do you expect to: (Check only ONE answer)

____1. Quit school as soon as possible
____2. Graduate from high school
____3. Graduate from a vocational, technical, trade or business school
____4. Graduate from a two-year or junior college
____5. Graduate from a four-year college or university
____6. Graduate from a graduate or professional school after college

22. As a result of using GIS, how often have you discussed your plans for after high school with the following people? (CHECK only ONE on EACH LINE)

1. N = NEVER
2. S = SELDOM
3. O = OFTEN

	N	S	O
1. Your parent (s)	___	___	___
2. A relative other than your parents	___	___	___
3. A guidance counselor	___	___	___
4. A teacher other than a guidance counselor			
	___	___	___
5. The principal or assistant principal	___	___	___
6. Clergy (minister, priest, rabbi, etc.)	___	___	___
7. State employment service officer	___	___	___
8. An adult not mentioned above	___	___	___
9. Friends your own age	___	___	___
10. People who are in the occupation in which I am interested	___	___	___

23. If there were NO obstacles, what is the highest level of schooling YOU WOULD LIKE to get? (CHECK only ONE answer)

____1. Quit school and go to work as soon as you are old enough
____2. Graduate from high school
____3. Graduate from vocational, technical, trade or business school
____4. Graduate from a two-year or junior college
____5. Graduate from a four-year colloege or university
____6. Graduate from a graduate or professional school after college

CIRCLE

24. Has using GIS helped you to make a career or job decision? YES NO
If YES, in what ways or how?

____

____

____

25. Has using GIS helped you to make a decision about further education or training? YES NO
If YES, in what ways or how?

____

____

____

26. Has using GIS helped you understand more about yourself? YES NO
If YES, in what ways or how?

____

____

____

27. Has GIS helped you to understand more about how to get a job? YES NO
If YES, in what ways and how?

____

____

____

28. Has GIS helped you to understand more about how to keep a job? YES NO
If YES, in what ways or how?

____

____

____

29. What job or occupation did you want to have BEFORE using GIS?

FIRST CHOICE ______________________________

SECOND CHOICE ______________________________

30. What job or occupation did you want to have AFTER using GIS?

FIRST CHOICE ______________________________

SECOND CHOICE ______________________________

Appendix F

MOICC CAREER GUIDANCE IMPACT STUDY
AGENCY USER'S POST QUESTIONNAIRE

SITE NAME ______________________________ DATE ______________________________

SOCIAL SECURITY
OR I.D. NUMBER ______________________________ AGE ______ SEX ______

CIRCLE HIGHEST GRADE COMPLETED IN SCHOOL 7 8 9 10 11 12 13 14 15 16 17 18 19

WHAT FILE OR FILES DID YOU USE? (Check those appropriate)

____ Occupation Information OCCU
____ Maine Occupation File MEOC
____ Armed Services Occupational Information ASOC
____ 4 Year College Information COL 4
____ 2 Year College Information COL 2
____ Graduate School GRAD
____ Financial Aid Information File AIDS
____ Maine Vocational Training File MEVT

HOW MANY TIMES DID YOU USE THE COMPUTER TO CALL UP THE FILES? ______

READ ITEMS 1 TO 20 AND RESPOND BY CIRCLING YES, NO OR UNSURE.

1. It was fun to use the computer terminal. YES NO UNSURE
2. Using GIS was a pleasant personal experience. YES NO UNSURE
3. Using GIS was a very cold, impersonal experience. YES NO UNSURE
4. The computer is a great way to get information to help with choosing occupations YES NO UNSURE
5. People should always have help from a human, never a computer. YES NO UNSURE
6. I learned a lot about myself using GIS. YES NO UNSURE
7. GIS helped me feel good about my career plans. YES NO UNSURE
8. I did NOT learn anything new about how to make career decisions by using GIS. YES NO UNSURE
9. Using GIS helped me to make the educational plans I need to make YES NO UNSURE
10. Using GIS helped me to learn more about my values as they relate to career planning. YES NO UNSURE
11. Using GIS helped me to learn a lot about occupations. YES NO UNSURE
12. Using GIS was a waste of time; it didn't help me at all. YES NO UNSURE
13. Using GIS helped me to learn more about my interests as they relate to career planning. YES NO UNSURE
14. Using GIS helped me to learn about my abilities as they relate to career planning. YES NO UNSURE
15. GIS helped me enough that I think all people should have the same opportunity I did. YES NO UNSURE
16. GIS helped me select a specific school or program for further education or training. YES NO UNSURE
17. I was confused or puzzled about my job plans after using GIS. YES NO UNSURE
18. GIS provided me with the type of information I wanted. YES NO UNSURE
19. The GIS information was easy to understand YES NO UNSURE
20. I read books and pamphlets about jobs and training after using GIS. YES NO UNSURE

AGENCY USER'S POST QUESTIONNAIRE continued

GIS - GUIDANCE INFORMATION SERVICE, COMPUTER BASED SYSTEM

21. Has using GIS helped you to make a career or job decision? YES NO
If YES, in what way or how?

22. Has using GIS helped you to make a decision about further education or training? YES NO
If YES, in what ways or how?

23. Has using GIS helped you understand more about yourself? YES NO
If YES, in what ways or how?

24. Has using GIS helped you to understand more about how to get a job? YES NO
If YES, in what ways or how?

25. Has GIS helped you to understand more about how to keep a job? YES NO
If YES, in what ways or how?

Appendix G

MOICC CAREER GUIDANCE IMPACT STUDY   BATCH PROCESSING REACTION FORM

SITE NAME OR NUMBER____________________ DATE________________

SOCIAL SECURITY
OR I.D. NUMBER__________________________ AGE____ SEX________

FILE OR FILES USED (Check those appropriate)

___Occupational Information OCCU
___Armed Services Occupational Information ASOC
___4 Year College Information COL 4
___2 Year College Information COL 2
___Graduate School GRAD
___Financial Aid Information File AIDS
___Maine Occupation File MEOC
___Maine Vocational Training File MEVT

1. Was the purpose of using the computer service clear to you? ___YES ___NO

2. Did you use the GIS guide and fill out the summary sheet? ___YES ___NO
If YES, did you have any problems doing this? ___YES ___NO

3. How interesting to you was using the GIS system?
___Enjoyed it
___Okay
___Disliked it

4. Did you get the type of information you wanted from the system?
___All I needed
___Needed more
___Not sure

5. What was your general reaction to using the system?
___It helped to make vocational and educational choices
___It was helpful. I learned useful things
___I am not sure now
___It was no help at all
___It was a waste of time

6. As a result of using the GIS system, I am planning to:
(Check those appropriate)
___Talk with my counselor   ___Talk with my parents
___Talk with my teachers   ___Talk with people in the occupation
___Write for school catalogs and information
___Get more books and materials to read on the topic
___Other (specify)______________________________

7. Did you understand the GIS printout? ___YES ___NO
If NO, why not? ______________________________

8. Did someone go over or help you interpret the printout?
If YES, who? ______________________ ___YES ___NO

OTHER COMMENTS:______________________________

Prepared by Staff, Career Education Center, College of Education,
UMO 10-1-79

Appendix H

MOICC CAREER GUIDANCE IMPACT STUDY
PUBLIC SCHOOL CAREER EDUCATION ACTIVITIES FORM

SITE NAME ________________________________ DATE ____________________

SOCIAL SECURITY
OR I.D. NUMBER ________________________________ AGE ______ SEX ______

CLASS: ____1. Freshman ____2. Sophomore ____3. Junior ____4. Senior

PROGRAM:
____1. College Prep
____2. General
____3. Vocational
____4. Commerical/Business
____5. Other

Please indicate how often you take part in the activities listed below. Mark an answer that is CLOSEST to what you think is the correct answer.

If you HAVE TAKEN PART, CIRCLE:
A. ALMOST EVERY DAY
B. ONCE A WEEK
C. ONCE OR TWICE A MONTH
D. LESS THAN ONCE A MONTH
E. NEVER

1. Use TV, tapes, filmstrips or radio to learn about jobs. A B C D E
2. Attend a career fair (a place where many different people come to talk about their jobs). A B C D E
3. Talk about jobs and careers with groups of students. A B C D E
4. Go around with workers to learn what they do on their jobs. A B C D E
5. Talk about how people in certain jobs and careers may have certain attitudes and values. A B C D E
6. Study the interests and abilities people need to have for particular jobs and careers. A B C D E
7. Talk with the class about what was learned about careers on field trips. A B C D E
8. Use the library or learning center to learn of careers. A B C D E
9. Go on field trips to business or industries to learn what people do in their jobs. A B C D E
10. Listen to workers (other than parents of students in the class) talk to the class about the work they do. A B C D E
11. Listen to the parents of other students in the class talk to the class about what they do in their work. A B C D E
12. Take tests to find out how much I know about different jobs and what people in them do. A B C D E
13. Take home material from class so that my parents can help me learn about jobs and what work I might want. A B C D E
14. Ask my parents questions about what they do at work. A B C D E
15. Hear that a person can choose any job and that a person's sex or race should not matter in making a job choice. A B C D E
16. Talk about my own values about work. A B C D E
17. Hear about how to look for and get a job (ex. how to read want ads, how to fill out a resume, how to conduct myself in an interview. A B C D E
18. Get personal advice from people in the school about my future job possibilities. A B C D E

PUBLIC SCHOOL CAREER EDUCATION ACTIVITIES FORM continued

IF you HAVE TAKEN PART:

A. ALMOST EVERY DAY
B. ONCE A WEEK
C. ONCE OR TWICE A MONTH
D. LESS THAN ONCE A MONTH
E. NEVER

19. Get personal advice from people at school about future educational possibilities and how to apply for college. A B C D E
20. Take tests to find out about my job interests and skills. A B C D E
21. Get personal help from people in the school in finding a paid job (either part-time or full-time). A B C D E
22. Take part in a school-supervised work experience or work-study program. A B C D E

Appendix I

GIS MANAGERIAL IMPACT INTERVIEW SCHEDULE

SITE #_______ SITE NAME:____________________________

CONTACT:____________________________________

1. Nature/extent of any program/curriculum changes attributable to GIS. (Any changes in the way in which career advice/counseling is given; e.g., group vs. individual counseling sessions)

2. Changes in resource allocation.
   - changes in staffing? (Needed/in place)
   - effect of GIS on time use by staff? More, less efficient use of time? Change in quality of time spent?
   - Nature, extent of requests submitted to funding agencies for any funding increases; or for funds to continue program?

3. Training programs. (Nature/extend) (In-service and off-site)
   - for staff/for new staff
   - for faculty
   - for students/clients

4. Attitude changes on part of participants (staff, faculty, students/clients)
   - toward career education?

   - toward computer use?

5. Use of MOICC and other State resources (CETA, Me. Job Service)

   - use of materials produced by MOICC: career ed. handbook; workshops

6. Cooperative ventures - sharing of facilities, programs, etc. with other agencies, schools, other groups?
   - with whom shared? How is payment arranged?

7. Has there been use of the computer terminal for other uses besides for GIS? Any proposed usage other than GIS? What?

8. Has site held, or planned, any public information activities, such as news releases, public information sessions, demonstrations at meetings such as civic groups, PTA's, local libraries? What?

Appendix J

Managerial Impact Analysis Report

December, 1979

Prepared by

Susan Hart
SSRI
UMO
Orono, ME   04469

MAINE CORRECTIONAL CENTER

The Maine Correctional Center uses GIS extensively as a source of career information to supplement more traditional sources, and the staff has noticed a very positive reaction on the part of the clients/users, some of whom have said they like the idea of getting printout so much that they have used it as posters on the walls of their rooms. The staff has found that using GIS in individual counseling sessions rather than in group or classroom settings is more useful to the clients. The faculty are very willing to refer students to GIS for information, but prefer not to use their classrooms for actual GIS experience because of the difficulty of supervising groups of users in an essentially individual activity. The staff has selected a group of seven students who were especially enthusiastic about GIS to help plan GIS-centered activities for the new calendar year. The use of GIS has increased with the appointment of a person responsible for counseling activities, which were until last summer handled by the vocational education teachers.

Funding for the continuation of GIS is difficult to obtain because of the nature of the facility. It is not an accredited school, and the program is oriented toward the needs of adults. Both of these factors eliminate many of the common sources of funding for career-education activities. In addition, it is difficult to pursue any public information activities because of legal restrictions concerning the use of student/client names or pictures in news items, and because of restrictions on travel by clients/students who might participate in demonstration projects. Implementation of GIS at this site was also hampered for a time by a change of personnel and a resulting lack of continuity in the program.

The staff and faculty at the Maine Correctional Center has always been willing to refer clients to a specific program, GIS, has made the clients more willing to participate, particularly since there is now one person who is responsible for helping them obtain the printout.

Sharing the terminal with the Maine Youth Center has been a problem because of the limited availability of the terminal itself and also because of some of the logistical problems involved. The terminal is not a true portable model, and there is evidence to suggest that it is too fragile to be moved about in the manner required by the sharing arrangement. It has therefore been inoperative on many occasions, although there seem to have been some recent technical improvements made. The population served by the Maine Correctional Center, however, is a particularly difficult one with which to deal, as individuals may be particularly impatient with a system which does not function at the proper time.

OLD TOWN HIGH SCHOOL

Old Town High School has extended its career guidance program as a result of the installation of GIS to include use of small groups in counseling, and also to expand the scope of individual career-counselling sessions. An exploratory business course at the high school has been substantially modified to take advantage of GIS.

No staffing changes have been made, although the duties of the guidance office secretary have been expanded to include activities associated with GIS, and a number of student aides have been trained to help their fellow students, freeing the guidance office staff for more intensive work with individual students. Teacher Corps personnel have also worked extensively with GIS. The training of student aides, staff members, and faculty members who are interested in learning about GIS is done on an individualized basis as the need arises.

The sharing of the computer terminal with Brewer High School has worked to mutual advantage, and Old Town High School anticipates that funding will be available to maintain the installation for another year.

The guidance office has expanded its library to include several GIS-related reference works. GIS has been deomonstrated to groups of parents at a financial aid night, and been shown to a group of Girl Scouts, and has been described in a newsletter to parents. It is expected that these activities will be expanded after the start of the new calendar year. The reaction of the staff toward GIS is that it allows a more efficient use of professional time while providing students immediate feedback as well as a sense of responsibility for obtaining career information on their own.

EDWARD LITTLE HIGH SCHOOL

GIS is the core of the career education program at Edward Little High School, and it allows the counselors to reach many more students than they did before the installation of GIS. There are four counselors who must deal with the needs of more than 1500 students. At least one-third of the students have now used GIS.

The school administration decided to have two of the guidance counselors use GIS extensively, and while the others are trained to use GIS, they do not work with it regularly. One of the counselors who regularly uses GIS has been appointed to a new position, Director of Vocational Guidance, which is a new position outside the guidance department. The activities associated with the start-up period of GIS were extensive, and consumed most of the time of one of the two counselors who works directly with GIS. Even with this initial work completed, it is felt that more staff could be used to help students follow up the information gained from their use of GIS. Most faculty members are not directly involved with GIS, although some have asked to learn about it, and the guidance counselors have helped them on an _ad hoc_ basis. The guidance counselors go to regularly scheduled classes (usually the math clases) to help students write their search instructions, and then the students run their programs with the help of the counselors or student aides.

The students who have used GIS are reported to have changed their attitudes with respect to computers, particularly those students who had thought that they were not capable of using a computer. Even the students in special education classes have been able to run their own computer jobs, which experience has been beneficial to them.

The counselors felt that MOICC had been very responsive to their needs, and that the workshops were very well run and helpful to them.

Edward Little shares the computer line with Lewiston High School, and once a schedule had been worked out there were no problems reported in this relationship. Funds have been requested of the school department to continue GIS, but although this body seems to be supportive of the concept of GIS, it is not clear that there will be any money available to continue the funding.

GIS has been widely publicized in the school through use of the student newspaper, and also outside the school, where parents in particular have been kept informed of GIS-related activities.

It is felt by the staff that while the information available in GIS is available elsewhere, that students would rarely have the perseverence to look for it. It was felt, however, that some of the files, particularly the Maine occupations file, should be updated more frequently.

PENOBSCOT CONSORTIUM C.E.T.A.

Penobscot Consortium CETA uses GIS primarily with its younger clients, and is using GIS increasingly as a counseling tool, always in conjunction with more traditional forms of counseling.

No changes in staffing are directly attributable to GIS, but the new Special Emphasis program will use GIS extensively. The way in which staff members are able to allocate their time has changed somewhat, although these changes are described as "marginal," primarily because of CETA's emphasis on individualized counseling. Because GIS would be especially useful in the new Job Corps program, it is hoped that funding will be available for another year.

Training for the staff includes two training sessions, run with the assistance of MOICC. CETA staff members who already are familiar with GIS train any newcomers to the staff. These trained staff members are on call for consultation from other Bangor area agencies who use GIS and might want advice on particular GIS-related problems.

CETA clients use GIS in batch mode for their first session, and thereafter they use the system interactively, as a supplement to an individualized counseling program.

CETA staff members are conducting their own in-house evaluation of the results of questionnaires administered to users of GIS, and because the data from this evaluation are not yet analyzed, it is difficult for the staff members to report upon any attitude changes that their clients may have had as a result of using GIS.

The site contact person emphasized that MOICC staff members had been extremely helpful to the CETA site during the first year of GIS implementation.

This site has not carried out any extensive publicity activities, but several groups of high school students have toured the CETA facility, and students from Bangor and Hampden schools have used GIS at the CETA site.

The site contact person reported that GIS is a valuable part of their program, but she emphasized that it is only one tool available to the staff for use in counseling. In addition, she cautioned that the Maine occupational files should be frequently updated if they are to be useful to CETA clients.

MAINE JOB SERVICE

Maine Job Service has held one group-oriented workshop as a result of the GIS installation, and another is planned after the beginning of the new calendar year. The workshop was attended by approximately eight users.

There has been no change in staffing as a result of GIS, and essentially no change in the use of time by staff, as the use of GIS by clients is on an individual basis under the direction of a staff member. It is expected that funding for the GIS installation will be continued for another year.

Staff training is handled on an in-house basis, involving a session lasting several hours, in addition to that training provided by arrangement with MOICC. MOICC materials have been used extensively in establishing the curriculum for the in-house training sessions.

Clients are reported to be intrigued with the use of the computer. It is the opinion of the staff that these same clients would not have the perseverence to use books to get the same information that they get from the computer, but that they like the structure imposed on their thinking by the program and are much more receptive to the computerized information than they are to information that comes from more traditional advising sources. Cole Sargent describes the GIS information as "toothpaste that tastes good."

The Maine Job Service shares their terminal with CETA; the arrangement works well for both parties.

Several groups have toured the Maine Job Service office, and in the course of the tour have heard about GIS. In particular, the Employer Advisory Committee has been interested in GIS. Several other agencies, including the Counseling Center, have referred clients to Maine Job Service to use GIS.

The site contact person describes GIS as having a very good fit with the Maine Job Service office, especially because the GIS information is designed to tie in with information that is routinely processed by the Maine Job Service office, such as the list of occupations currently available in Maine.

UNIVERSITY OF MAINE AT AUGUSTA COUNSELING OFFICE

GIS has been used at the University of Maine at Augusta primarily to augment the programs already established there. The career development courses have been modified to include GIS exercises. GIS is also used with individual students, particularly when the students need some help in narrowing their career search activities.

Some changes in staffing have occurred. CETA is currently funding the positions of two career aides, and the responsibilities of the GIS site contact person have changed so that she is now officially the coordinator of the career planning activities, including GIS. She indicates that GIS allows the staff to use time more efficiently because GIS can handle routine requests for information which previously had required professional staff time. Funding is currently being sought for the continuation of GIS.

Small workshops have been held to train UMA administrators and staff in the use of GIS. Some staff families and some UMA clerical staff members have also learned how to use GIS. A demonstration of GIS was included in the college orientation sessions.

The site contact person feels that the availability of GIS has heightened awareness of career planning activities on the campus because GIS has been advertised. Several faculty members have sought information about GIS, and the president and dean are supportive of the system.

GIS is used extensively in connection with the Displaced Homemakers Program. The counseling office has also run workshops for CETA's counseling staff, and for CETA clients, as well as batch processing for a summer youth-oriented program. Students from two local high schools have also been introduced to GIS at this site.

Feature articles in the Kennebec Journal and in almost all of the editions of the student newspaper have publicized the availability of GIS at UMA. The counseling office has sent letters to all six county high schools inviting their participation in GIS. Staff people have given presentations to the Rotary Club. The office expects also to print a brochure describing GIS.

BREWER HIGH SCHOOL

The Brewer High School career education program now includes more work with students in small groups as a result of the installation of the GIS system. The content of the group sessions has also changed to include information about the uses of computers in obtaining information about careers. The staff at Brewer High School feels that GIS has allowed them to use their time more efficiently, since routine questions can be answered by the computer, leaving the counselors free to give students more individual attention on more important questions. A group of student aides is available to help their peers, an arrangement that also allows more time for individual counseling on the part of the professional staff.

Faculty members at the high school have been quite willing to refer their students to GIS, the several faculty members who have been especially interested in GIS have been trained on an ad hoc basis to assume the costs of the installation for the year 1980-81.

The staff notes a significant change in the attitude of students who formerly thought of the guidance office as a place one had to go to only if one were "in trouble." The installation of GIS has served to change the image of the guidance office to that of a resource to be used by all students, with a resulting increase in the number of students visiting the office voluntarily.

Brewer High School shares a terminal with Old Town High School. Both sites find the arrangement satisfactory. In addition, the Brewer High School guidance counselor has sent letters to other area high schools inviting their career education counselors to send students to Brewer to use GIS. A number of students have visited the Brewer site from John Bapst High School in Bangor, from Hampden, from Bucksport, and from Hermon High School.

The GIS site contact person has spoken to the Bangor Rotary Club concerning GIS, and as the teacher of a life work planning adult education course has introduced a number of adult students to GIS through a demonstration program conducted at the Maine Employment Security Commission offices. A number of the students returned to the Maine Job Service office for additional time on the computer.

MAINE YOUTH CENTER

GIS is the central feature of the Maine Youth Center's new career incentive project. Staff positions were created for personnel who would deal directly with GIS, and since the project is in the second year of a planned five-year program, the continuation of funding is expected. The Maine Youth Center plans to buy its own terminal, as its sharing of the terminal with the Maine Correctional Center is inconvenient for both sites.

Training programs for the staff included a week-long in-house workshop in addition to that training provided by MOICC. It is anticipated that once the Maine Youth Center gets its own terminal it may use the terminal to access other types of information in addition to that available through GIS.

The staff at this site have not as yet carried out any public information activities involving GIS.

In general, GIS was described as an excellent motivator of students at this site because it produces a tangible product (the printout), which the traditional student-counselor conference does not.

HOULTON REGIONAL VOCATIONAL HIGH SCHOOL: S.A.V.E.

GIS is used very little by students actually attending S.A.V.E. because they are in the building for only two hours per day (in two shifts), and they have no study halls or free time while they are at S.A.V.E.. Most of the students are bused, so they cannot stay after school hours. Most of the use of GIS is through the guidance staff of the sending school. Groups of students come to S.A.V.E. to use the terminal, or a teacher runs searches in batch mode. The users of GIS at S.A.V.E. are therefore not limited to students in vocational programs. Because of the characteristics of the user population, there has been little effect on S.A.V.E. staff or upon their use of time.

S.A.V.E. has a grant for a Rural Guidance Resource Center which will serve the out-of-school population, and funds for GIS are included in the grant. Once the programs funded by this grant are in operation, it is expected that the use of GIS will increase, especially on the part of the adult, out-of-school users. S.A.V.E. seems to be a good location for a regional GIS installation, if some local schools are not able to fund their own GIS installations.

It is the impression of the S.A.V.E. staff that some students may be overwhelmed by the amount of information that they receive from GIS; others specify so many restrictions on their career choices that they limit themselves to only one or two career possibilities and become discouraged. The staff realizes that it is the role of the professional career counselor to help the students deal with these situations.

S.A.V.E. staff have demonstrated GIS for their Board of Directors, and in individual sessions, for some local sitizens who had expressed an interest in the installation.

Each guidance counselor uses GIS in his or her own way, although students are introduced in the context of their regular classes to GIS, and then are invited to the guidance office to run GIS with the assistance of a counselor or a student aide. It has become clear that each grade level has different neess which can be fulfilled by different uses of GIS, and the guidance department is developing materials which will be responsive to these different needs.

All six guidance counselors and one student intern from Bates College are trained to use GIS, and eight or nine teachers were trained last year in a workshop to use GIS. Whenever a guidance counselor meets with a class of students to introduce them to GIS the teacher in that classroom becomes involved in learning about GIS in addition to the students. It is hoped that eventually all the faculty members will be trained to use GIS. Local funding is available to continue GIS after the current year.

The career counselors feel that GIS helps students to order their thinking about careers, and that because GIS is fun to use, more students will use it than would have used traditional methods of learning about career planning. The guidance counselors are conducting their own in-house evaluation to see the effects of GIS on student job search behavior. The staff at Lewiston High School feel that it was unfortunate that two high schools as large as Lewiston and Edward Little shared a computer line. Although it was possible to arrange a schedule of use, it is felt that Lewiston could easily use a full-time line of their own.

The career planning staff at Lewiston would probably have had GIS installed even without MOICC because one of the counselors has used it at another location. Because they wish to keep GIS, they have made certain that the principal, other teachers, and the school board are kept informed of GIS-related activities, with the result that all these groups or individuals are supportive of GIS.

AROOSTOOK C.A.P.

Because the ACAP clients are geographically dispersed, outreach workers collect the input information needed for a search, and the job is run in batch mode. The outreach worker then delivers the printout to the client. Clients are, therefore, able to obtain information to which they would not have access without GIS. Job developers also refer clients to GIS. The availability of GIS has enabled outreach workers to work more efficiently because they can give clients information in a consistent, concise, and complete and printed form. ACAP would like to approach area schools about sharing a terminal and line, but CETA regulations may forbid this arrangement because it would require spending some staff time on non-CETA persons because of the necessity of demonstrating GIS in the schools. In addition, ACAP would like to offer a "GIS field trip" to students in area schools, but this activity may also be outside the range of activities allowed by CETA. ACAP would also like to arrange for terminal time on some of the installations in the Houlton area for ACAP's workers in that part of the county.

The heaviest use of ACAP's installation has been during the summer of 1979, when about 400 users in the youth program used GIS in five or six weeks. ACAP personnel feel that GIS is the best source of career information available to the out-of-school population which comprises their clientele.

HODGTON HIGH SCHOOL

At Hodgton, the availability of GIS has allowed more career planning to be presented to eighth and ninth graders. In the seventh and eighth grades, the teachers help write the search instructions, and the career counselor runs the programs for the students. In the high school, the career planning counselor helps the students write their search instructions in class, and then he works with the students two at a time to run their programs at the terminal.

No staffing changes have been made, but several student aides are able to help their peers answer routine questions about the search procedures and the operation of the terminal. The site contact person reports that having GIS is like having another person in the guidance office, particularly if the students are able to run GIS themselves. The career planning counselor is freed to offer other individualized service to students which would be impossible without GIS. More physical space is needed, however, because the terminal and its users take up a considerable amount of room in a space that is already overcrowded. Continued funding has been sought, and although the assistant superintendent is supportive, he is not optimistic about the continuing availability of funds.

Some faculty members have asked to be trained to use GIS. The guidance counselor trains these persons as they request such training.

The guidance counselor thinks the experience of actually using a computer is beneficial, especially for some of the more advanced students.

The terminal is shared with Houlton High School, and the line is shared with Houlton High School and S.A.V.E.. Sharing the line has not presented any problems, but the transporting of the terminal is a nuisance, particularly in the winter.

GIS has been demonstrated to the school board and to some local citizens on an individual basis.

HOULTON HIGH SCHOOL

The career planning counselor has visited every senior level English class in order to invite students to try GIS. Those students who are interested (about one-third to one-half of the students volunteer for further work) are seen in small groups in the career education room. Most of the interest among seniors is among those planning to attend college. Students use the terminal in a small group setting, which allows then to help each other use the program and also to see information about a greater variety of schools or occupations. There have been no changes in staffing as a result of GIS, but staff time is used more efficiently because students can run their searches by themselves and can find information that would take even a counselor a long time to find in more traditional sources.

All the counselors have been trained to use GIS, and there is a group of about twenty-five students who are very much interested in GIS who come almost every week to use GIS and to help their friends use it. Searches are also run in batch mode for seventh and eighth graders in order to introduce them to career planning.

Houlton High School has asked for local funding to continue with GIS, but it is not certain that this request will be granted. It is possible that an arrangement will be made with S.A.V.E. to share the costs of an installation, but the career planning counselors would prefer to have their own terminal and line.

The guidance counselors have noticed that one major change with GIS helps bring about in students' attitudes is that GIS helps them to narrow unrealistic career expectations. The students seem to enjoy using the computer, while they would not have been interested in using books to obtain the same information.

The training and materials provided by MOICC were reviewed favorably by the guidance counselors, although they would have preferred a shorter training session.

Students' parents hear about GIS from the school, and from their children. It is felt that because students have something tangible to bring home (the printout), students are more likely to discuss career plans in the home with their parents.

Appendix K

CHI SQUARE ANALYSIS OF THE PUBLIC SCHOOL USERS POST QUESTIONNAIRE BY TYPE OF COMMUNITY, AGE, SEX, CLASS AND PROGRAM

	Type of NS	Age	Sex	Class	Program
Number of times used computer	96.08***	53.79NS	27.28**	43.94NS	64.89*
Rating OCCU	22.22*	27.58NS	2.20NS	13.27NS	19.28NS
Rating of MEOC	17.67NS	22.54NS	8.41NS	9.83NS	10.87NS
Rating ASOC	20.82NS	17.96NS	10.69*	15.49NS	23.49NS
Rating of Col 4	23.12*	20.03NS	3.82NS	26.38**	29.59
Rating of Col 2	9.99NS	18.41NS	5.41NS	10.04NS	9.08NS
Rating of GRAD	9.24NS	30.89NS	3.27NS	13.42NS	18.33NS
Rating of AIDS	12.17NS	12.70NS	0.82NS	14.18NS	14.19NS
Rating of MEUT	7.76NS	18.29NS	4.79NS	14.04NS	22.31NS
Fun to use computer terminal	15.14NS	14.82NS	7.33NS	6.35NS	3.94NS
Pleasant personal experience	12.99NS	12.61NS	6.94NS	14.68NS	10.96NS
Cold impersonal experience	13.45NS	32.76NS	6.24NS	18.84NS	26.28*
Great way to get help	16.63NS	41.65*	3.64NS	18.88NS	11.47NS
Help from human	25.85**	38.95*	7.13NS	6.09NS	20.61NS
Learned alot about myself	18.97NS	10.31NS	2.60NS	11.95NS	20.43NS
Helped me feel good about plans	28.21*	16.65NS	1.72NS	12.14NS	16.33NS
Did not learn anything new	23.01	20.44NS	2.47NS	7.04NS	12.97NS
Helped with education plans	12.11NS	17.37NS	2.11NS	12.83NS	17.62NS
Learned more about values	27.09**	17.80NS	3.44NS	7.95NS	22.23NS
Learned alot about occupations	22.76*	31.36NS	3.44NS	21.27*	12.90NS
Waste of time/ didn't help	15.13NS	35.03NS	3.82NS	22.44**	13.92NS

	Type of NS	Age	Sex	Class	Program
Learned more about my interests	17.07NS	18.87NS	0.21NS	12.48NS	17.59NS
Learned more about my abilities	11.75NS	31.95NS	2.93NS	14.50NS	15.98NS
All students should have opportunity	20.69NS	20.84NS	3.60NS	16.62NS	14.94NS
Helped in selecting specific school	18.67NS	16.92NS	6.35NS	8.76NS	18.63NS
Helped me discover some imp.	15.08NS	12.11NS	5.00NS	3.77NS	13.16NS
GIS provided me type of info. wanted	25.05*	23.61NS	1.46NS	12.35NS	21.62NS
Info. from GIS easy to understand	24.27**	16.69NS	4.42NS	20.07NS	26.24*
Began using books & other materials	6.84NS	27.24NS	5.32NS	16.69NS	25.78*
Schooling think you will get	40.43***	25.64NS	18.77**	35.38**	102.32***
Talk with parent	18.19*	33.15**	2.23NS	14.62NS	12.50NS
A relative	11.33NS	25.79**	0.82NS	21.36**	17.14
A guidance counselor	14.55*	31.69***	2.66NS	24.77***	5.77NS
A teacher	10.47NS	22.83NS	1.44NS	17.88*	16.45NS
The principal	24.88***	12.43NS	1.33NS	4.62NS	8.15NS
Clergy	8.06NS	7.58NS	2.44NS	3.17NS	14.29NS
State Fmp. Officer	15.56**	16.25NS	0.97NS	3.65NS	11.15NS
Other Adult	13.85*	16.69NS	1.56NS	11.75NS	8.02NS
Friends own age	15.47*	19.73NS	2.30NS	11.36NS	11.44NS
People in occupation	19.71NS	33.32NS	1.44NS	19.02NS	10.19NS
Schooling like to have	40.76***	26.12NS	32.22***	16.45NS	95.62*
GIS					
Make Career Decision	3.62NS	5.19NS	5.43*	0.58NS	13.80**
Make Educ Decision	0.71NS	3.11NS	0.01NS	0.26NS	3.68NS
Self Understanding	10.56NS	4.99NS	1.88NS	2.74NS	12.50NS
Job Seeking strategies	6.42NS	5.70NS	1.14NS	14.76**	13.93**
Job keeping skills	7.09NS	7.97NS	1.37NS	11.74**	17.84**

GLOSSARY

To facilitate understanding of technical terms used in this report the following definitions are provided. Usage in the report is intended to conform to general use in research.

Note - the first time a glossary word appears in the text of the report, it is in CAPITALS.

ANALYSIS OF VARIANCE. A statistical procedure used to study differences and relations among variables (a trait, characteristic of property of something).

CAREER EDUCATION. A comprehensive developmental K-12 curriculum process which utilizes teachers, counselors and community members to assist students in making better life career decisions as they relate to training, educational and employment opportunities. Through this process, students relate their interests, abilities and aptitudes to accurate, up-to-date career and occupational information, thereby broadening their awareness of career opportunities in Maine.

CAREER GUIDANCE. A systematic program of counseling and informational activities designed to increase occupational knowledge and relate to self knowledge. A primary goal is to increase self awareness and career development.

CHI SQUARE. A statistical technique for comparing an observed frequency distribution to a hypothetical frequency distribution (Symbol, X^2).

DESIGN. An overall plan of a research study. Also used to prescribe statistical treatment of data.

EXPERIMENTAL DESIGN. Structured inquiry that (1) utilizes acceptable scientific methodology to solve problems and (2) creates new.

GIS. A computerized career information system developed by Time Share, Inc.

HAWTHORNE EFFECT. Refers to experiments conducted by Western Electric in 1924 to measure whether a new degree of lighting increased productivity. Behavior changes that occur when the subjects in an experiment or evaluation are aware of their special status are referred to as the "Hawthorne effect".

MOICC. Maine Occupational Information Coordinating Committee.

MEAN. The arithmetic average of scores for a sample of subjects (Symbol is $\bar{X}$).

MEDIAN. The score in the middle, so that half of the scores are equal to or less than the median.

MODE. The score with the highest frequency.

MODIFIED TIME SERIES DESIGN. Time Series evaluation designs involve collecting information about the same group or groups over several periods of time.

OPINION/FACT SURVEY. Any formal collection of particulars made to ascertain opinion on the conditions within a specified set of subjects. Sampling may be used for large populations.

QUESTIONNAIRE. A list of questions about a specific topic organized so that it can be reacted to by subjects under study.

QUOTA SAMPLING. Selection of a set number of something to serve as an example.

RANDOM SAMPLE. Each element of the population has equal probability of appearing in the sample and is chosen independently of all other sample element selection.

RANDOM SELECTION. Procedures to study materials, sources, or subjects such that each element chosen for study is selected with equal probability and independence.

RANGE. The difference between the lowest and highest score in a distribution.

STANDARD DEVIATION. The positive square root of the variance or dispersion of a set of scores. It is obtained by squaring each difference in a set of scores from the mean. The average of the squared deviations is called the variance of the scores (Symbol is SD).

STATISTICALLY SIGNIFICANT. Differences which are likely to have arisen by chance and are given special attention in the interpretation of the results.

VARIANCE. The mean square; the mean of a set of squared deviation scores. It is used to study differences and relations among variables.